

MATERIALS TOWARD A MONOGRAPH OF THE GENUS LIPPIA. IX

Harold N. Moldenke

LIPPIA TAYACAJANA Moldenke

Additional bibliography: Moldenke, *Phytologia* 12: 506. 1966.

Shrub, about 1 m. tall; branches slender, tetragonal, ribbed, densely short-pubescent when young, glabrescent in age and then with peeling shreddy bark, brown, somewhat twiggy below; twigs very short, leafy; nodes not annulate; principal internodes much abbreviated, 1--3 cm. long; leaves decussate-opposite; petioles slender, 1--2 mm. long and densely short-pubescent or obsolete; leaf-blades firmly chartaceous, uniformly gray-green on both surfaces, oblanceolate-elliptic, 0.8--1.9 cm. long, 3--9 mm. wide, rounded or acute at the apex, cuneate-attenuate at the base, revolute along the margins and serrate from about the middle to the apex, scabrous and substrigose above, densely tomentellous beneath; midrib and the slender secondaries deeply impressed above, very prominent beneath; inflorescence axillary, solitary in each axil, 1--1.5 cm. long, capitate, rather few- or submany-flowered; peduncles very slender or filiform, 10--12 mm. long, densely appressed-pubescent with antrorse canescent or yellowish hairs; heads small, about 5 mm. long and wide; bractlets lanceolate, about 4 mm. long and 1.5 mm. wide, sharply acute at the apex, densely appressed-strigose-pubescent; corolla hypocrateriform, white, about 5 mm. long, its limb about 2 mm. wide.

The type of this species was collected by August Weberbauer (no. 6510) in the valley of the Mantaro, northeast of Pampas, in the province of Tayacaja, Huancavelica, Peru, at an altitude of 1800--1900 meters, in March, 1913, and is deposited in the United States National Herbarium at Washington. The species is obviously closely related to L. ferruginea H.B.K. It has been found growing on dry slopes at an altitude of 1450 to 1900 meters, flowering in March and June. A vernacular name recorded for it is "limoncillo". The Asher, Kates, & Cia. 17987, cited below, is placed here tentatively because of its fragmentary nature.

In all, 4 herbarium specimens, including the type, and 2 mounted photographs have been examined by me.

Citations: PERU: Huancavelica: Weberbauer 6510 (N--isotype, N--photo of type, W--1495440--type, Z--photo of type). La Libertad: López Miranda & Sagástegui 3358 (Z). Department undetermined: Asher, Kates, & Cia. 17987 (Kr).

LIPPIA TEGULIFERA Briq., *Ann. Conserv. & Jard. Bot. Genève*. 7-8: 309--310. 1904.

Synonymy: Lippia tegulifera var. parvifolia Briq., *Ann. Conserv. & Jard. Bot. Genève*. 7-8: 310. 1904. Lippia tegulifera var. tegulifera [Troncoso], *Darwiniana* 12: 280 & 281. 1961. Lippia tegulifera Big. ex Moldenke, *Résumé Suppl.* 10: 6, in syn. 196. Lippia

tenulifera Briq. ex Moldenke, *Résumé Suppl.* 10: 6, in syn. 1964.

Bibliography: Briq., *Ann. Conserv. & Jard. Bot. Genève.* 7-8: 309--310. 1904; Briq. in Chod. & Hassler, *Fl. Hassler.* 2 (11): 492. 1904; Prain, *Ind. Kew. Suppl.* 3: 104. 1908; Moldenke, *Lilloa* 5: 429. 1940; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 1], 41, 43, & 96. 1942; Moldenke, *Lilloa* 10: 343 (1944) and 12: 148. 1946; Moldenke, *Alph. List Cit.* 1: 264. 1946; Moldenke, *Alph. List Invalid Names* 15. 1947; Moldenke, *Phytologia* 2: 386 (1947) and 2: 481. 1948; Moldenke, *Lilloa* 14: 46 & 47. 1948; Moldenke, *Alph. List Cit.* 2: 342, 376, 440, 457, 600, & 627 (1948), 3: 837 & 863 (1949), and 4: 1165, 1169, & 1237. 1949; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 99, 105, & 191. 1949; Moldenke, *Résumé* 117, 126, 317, & 463. 1959; Troncoso, *Bol. Soc. Argent. Bot.* 9: 184. 1961; Troncoso, *Darwiniana* 12: 258 & 280--282, fig. 12 k--o. 1961; Moldenke, *Résumé Suppl.* 10: 4 & 6 (1964) and 12: 11. 1965; Moldenke, *Phytologia* 12: 24 & 430. 1965.

Illustrations: Troncoso, *Darwiniana* 12: 281, fig. 12 k--o. 1961.

Dioecious shrub or subshrub, 0.3--0.6 m. tall, with a woody caudex at the base; aerial stems erect, woody or indurated, simple or branched; internodes tetragonal, short or very short, pubescent throughout with appressed and also longer ascending-patulous or sometimes crisped ferruginous hairs; leaves decussate-opposite or approximate, abundant, closely appressed to the branches in imbricate fashion, sessile; leaf-blades elliptic to elliptic-lanceolate, small, 8--20 mm. long, 5--8 mm. wide, shortly acuminate or acute at the apex, more or less convex along the margins, more convex below the middle, regularly and abundantly crenate or crenulate, cordate at the base, stiff, coriaceous, rigid, ferruginous-green, scabrid above, sparsely strigose-pubescent with coarse hairs on both surfaces, also appressed-pubescent beneath, very prominently penninerved, lineate-rugose above; secondaries approximate, parallel, impressed above; heads globose, medium-sized, opposite in the leaf-axils, subsessile or very short-pedunculate, 5--8 mm. long and wide, cinereous-pubescent or incanous; peduncles tetragonal, shorter than the subtending leaves, hardly more than 5 mm. long, pubescent or incanous throughout; bractlets ovate, acuminate at the apex, about equaling the leaves, villous-pubescent on the outer surface; calyx very small, campanulate, about 0.6 mm. long, rather densely antrorsely pubescent, 2-labiate, the lips small, entire or obscurely sublobulate; corolla hypocrateriform, yellow, small, surpassing the calyx-mouth by about 2 mm., the tube exerted, subglabrous, the limb puberulent, the lobes about equal, about 0.5 mm. long, the anterior one longer; stamens and pistil normal for the genus, included; fruit small, smooth, 1.5 mm. long, rather densely villous like the fruiting-calyx, the cocci splitting apart on maturity.

Briquet (1904) proposed this species with 4 constituent varieties, of which I regard the first, var. *parvifolia*, as the typical one. The type, then, of the species is that of the typical form, collected by Benedict Balansa (no. 1031, in part) on the

campos at Caaguazu, Paraguay, on November 7, 1874, and deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques at Geneva. Briquet describes this typical form as follows: "Caules aërii 30--60 pilis brevibus adpressis et aliis longioribus ascendenti-patulis nunc aliq. crispulis ferrugineis obtecti. Folia creberrima, parva, elliptico-lanceolata, utrinque pilis strigosis grossis sparsis praedita et praeterea subtus adpresse pubescentia, supra aspera, ferrugineo-viridia, superficie 0,8--2 x 0,3--0,8 cm. Capitula demum sect. long. 5--8 x 5--8 mm. subsessilia vel brevissime pedunculata, pedunculis vix ultra 5 mm. altis quam folia brevioribus." He says of the species: "Cette remarquable espèce se place dans le groupe Axilliflorae de la section Zapania: elle ne peut être étroitement rapprochée d'aucune des espèces connues: son port, qui est celui des Oftia, lui donne une place à part." He says that Balansa 1031 is actually a mixture of the typical L. tegulifera, var. ovata, and var. pedunculata.

The second Briquet reference given in the bibliography above is cited at the Instituto Miguel Lillo as "Plantae Hasslerianae XI (1904) 492." The species is obviously very closely related to L. arechavaletae Moldenke.

Collectors have found this plant growing on wet or humid savannas, campos, high campos, and the banks of rivers, at 150 meters altitude, flowering from September to May and in July, fruiting in November and December. Rojas found it on a "campo pendiente de loma"; Anisits describes it as "rare" on campos, while Quiroga found it to be "abundant in high sandy uncultivated campos."

It should be noted that the University of Michigan specimen of Ekman 2014 is definitely the typical form of the species, with elliptic leaves, while the Britton Herbarium specimen of the same number is definitely var. ovata, with ovate leaves. Troncoso (1961) says: "Especie polimorfo de la que su autor distingue 4 variedades. La var. parvifolia ha sido considerada por Moldenke como la var. típica. Quadaría así el ejemplar Balansa 1031 pp como tipo. El valor de las restantes: var. ovata, var. pedunculata y var. grisea requerirá un minucioso estudio en base a observaciones de abundante material que permita apreciar la constancia de sus caracteres diferenciales. Por el momento me remito a citarlas como tales. Lippia tegulifera es una especie dioica." She cites the following 31 specimens: PARAGUAY: Balansa 1031, in part (Bf--lectotype, Bm--lectotype, Cb--lectotype, K--lectotype, P--lectotype, Si--lectotype); Hassler 1079 (Cb, K, P), 4958 (Bm, Cb, K, P), 6108 (Bm, Cb, K, P, Si), 6108a (Cb); Jørgensen 3780 (Si); Montes 7188 (Si); T. Rojas 3422 (Si), 5151 (Si), 6087 (Si). ARGENTINA: Corrientes: Burkart 7861 (Si); Ibarrola 3963 (Ml). Misiones: Burkart 14751 (Si), 15307 (Si); D. Rodríguez 697 (K, Ra, Si). Of these she says that Hassler 6108 (Bm, K, P) and T. Rojas 6087 (Si) are definitely staminate specimens; Hassler 6108 (Si), Jørgensen 3780 (Si), and T. Rojas 5151 (Si) are definitely pistillate speci-

mens; while Burkart 7861 (Si) is both staminate and pistillate. Hassler 6108 is definitely var. ovata, 1079 was called var. pedunculata by Briquet, and 6108a was called var. ovata by Briquet.

Material has been misidentified and distributed in herbaria as var. ovata Briq. and as L. pumila Cham. In all, 36 herbarium specimens, including type material of all the names involved, and 6 mounted photographs have been examined by me.

Citations: PARAGUAY: Anisits 1926 (S); Balansa 1031, in part (F—photo of lectotype, N—photo of lectotype, S—lectotype, Si—photo of lectotype, Z—photo of lectotype); Hassler 8994 (F—876815, V), 9142 (Ca—929822, Cb, N, N—photo, V, Z—photo); Jørgensen 3780 [Herb. Osten 22234] (Du—197830, S, Ug, W—1483632), s.n. [Herb. Mus. Argent. Cienc. Nat. 28/2072] (N); Kuntze s.n. [Stud-Paraguay, IX.92] (N); T. Rojas 3422 [Herb. Osten 18196] (Ug), s.n. [Herb. Osten 15647] (Ug). ARGENTINA: Corrientes: Ibarrola 3963 (N), 4012 (N, N, S); Ruiz Huidobro 2082 (S), 2169 (N, S, Vi). Formosa: Venturi 9091 (W—1591416). Misiones: Burkart 14751 (N, W—2056385); Ekman 2014, in part (Mi); Montes 1715 (N); Quiroga 419 [Herb. Osten 7682] (Ug), 432 [Herb. Osten 7682] (Ug), 7682 (Go), s.n. [Herb. Osten 7682] (S); D. Rodriguez 697 [Herb. Inst. Miguel Lillo 32236] (Ca—3372, N, W—1802580, W—1858291).

LIPPIA TEGULIFERA var. GRISEA Briq., Ann. Conserv. & Jard. Bot. Genève. 7-8: 310—311. 1904.

Bibliography: Briq., Ann. Conserv. & Jard. Bot. Genève. 7-8: 310—311. 1904; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 41 & 96 (1942) and [ed. 2], 99 & 191. 1949; Moldenke, Résumé 117 & 463. 1959; Troncoso, Darwiniana 12: 282. 1961.

This variety differs from the typical form of the species in having its aerial stems more robust, over 60 cm. tall, densely griseous with short appressed hairs and longer ascending ones; leaf-blades elliptic-lanceolate, medium in size, rather dense, very acute at the apex, roughened above and pubescent with small scattered hairs, densely and rather softly pubescent beneath, griseous, 2—3 cm. long, 1 cm. wide; heads griseous-canescant, to 1 cm. long and 8 mm. wide, short-pedunculate; peduncles shorter than the subtending leaves, 1—1.5 cm. long; bractlets ovate-acuminate.

The type of this variety was probably also collected by Benedict Balansa, although Briquet cites no collector or number, in pastures on the plain of Pirayu-bi, Paraguay, on February 11, 1878, and is probably deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques at Geneva. Nothing is known to me of this taxon except what is stated in the literature.

LIPPIA TEGULIFERA var. OVATA Briq., Ann. Conserv. & Jard. Bot. Genève. 7-8: 310. 1904.

Bibliography: Briq., Ann. Conserv. & Jard. Bot. Genève. 7-8: 310. 1904; Moldenke, Lilloa 5: 429 (1940) and 8: 426. 1942; Mol-

denke, Known Geogr. Distrib. Verbenac., [ed. 1], 41 & 96. 1942; Moldenke, Alph. List Cit. 1: 26, 263, 264, & 266. 1946; Moldenke, Phytologia 2: 386. 1947; Moldenke, Lilloa 14: 46 & 47. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 99, 105, & 191. 1949; Moldenke, Alph. List Cit. 3: 690 (1949) and 4: 1257. 1949; Moldenke, Résumé 117, 126, & 463. 1959; Troncoso, Darwiniana 12: 282. 1961.

This variety differs from the typical form of the species in having its leaves less imbricately crowded, often somewhat larger, to 2 cm. long and 1.5 cm. wide, ovate, rather acutish at the apex, the margins below the middle conspicuously convex, the base conspicuously cordate.

The type of this variety was collected by Benedict Balansa (no. 1031, in part) on the campos at Caaguazu, Paraguay, on November 7, 1874, and is deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques at Geneva. According to Briquet (1904) Balansa 1031 is a mixture of typical L. tegulifera Briq., var. pedunculata, and var. ovata. Similarly, the specimen of Hassler 6108 photographed by Macbride in the herbarium of the Botanisches Museum at Berlin as his type photograph number 17551 was originally labeled "6108", but Briquet avers that this number consists of a mixture, too, and he cites the var. ovata portion as "6108a". Troncoso (1961) regards the true 6108 material as var. pedunculata Briq.

The variety ovata is described as having yellow flowers, like the typical form, grows 20—80 cm. tall, on campos and rocky campos, flowering in September and November. The Britton Herbarium specimen of Ekman 2014 is definitely var. ovata, with ovate leaves, while the University of Michigan specimen of the same number is definitely the typical form of the species, with elliptic leaves.

Material has been misidentified and distributed in herbaria as L. tegulifera Briq. and as L. pumila Cham. In all, 14 herbarium specimens, including type material, and 11 mounted photographs have been examined by me.

Citations: PARAGUAY: Balansa 1031, in part (Br—istype, F—photo of isotype, N—istype, N—photo of isotype, Si—photo of isotype, Z—photo of isotype); Hassler 4958 (N), 6108 (Ca—944353, Mi, N, N, S), 6108a [Macbride photos 17551] (It—photo, Kr—photo, N—photo, N—photo, W—photo), 9906 (N, N—photo, V, Z—photo); Hauthal 23 (N). ARGENTINA: Misiones: Ekman 2014 (N, S); A. G. Schulz 7110 (Sz).

LIPPIA TEGULIFERA var. PEDUNCULATA Briq., Ann. Conserv. & Jard. Bot. Genève. 7-8: 310. 1904.

Bibliography: Briq., Ann. Conserv. & Jard. Bot. Genève. 7-8: 310. 1904; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 41 & 96 (1942) and [ed. 2], 99 & 191. 1949; Moldenke, Résumé 117 & 463. 1959; Troncoso, Darwiniana 12: 280—282, fig. 12 a—j. 1961.

Illustrations: Troncoso, Darwiniana 12: 281, fig. 12 a—j. 1961.

This variety differs from the typical form of the species in having its aerial stems simple, virgate; leaves medium-sized, less imbricate, scarcely exceeding the internodes, elliptic-lanceolate, very acute at the apex, the crenate-dentate teeth more acute, more robust, 2--2.5 cm. long, 6--8 mm. wide, the indumentum of the stem and leaves as in var. ovata; heads longer-pedunculate, the peduncles equaling the leaves or sometimes surpassing them, to 2 cm. long, the bractlets narrower and more acute.

The type of this variety was collected by Benedict Balansa (no. 1031b) in clearings in the forests, Cordillera de Peribebui, Paraguay, on January 11, 1877, and is deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques at Geneva. Balansa 1031 is, according to Briquet (1904), a mixture of typical L. tegulifera, var. ovata, and var. pedunculata. This portion was apparently collected at a different locality and on a different date than the other two portions previously discussed. It is said to have had a heavy woody rootstock. Troncoso (1961) states that Briquet regarded Hassler 1079 as this variety; she regards Hassler 6108 as this variety, too, but I cite this number under var. ovata. Nothing further is known to me of var. pedunculata.

LIPPIA TEPICANA Moldenke, Phytologia 1: 454--455. 1940.

Synonymy: Lippia mexicana Moldenke, Alph. List Invalid Names Suppl. 1: 14, in syn. 1947. Lantana canescens Benth. ex Moldenke, Résumé 304, in syn. 1959 [not L. canescens H.B.K., 1817].

Bibliography: Moldenke, Phytologia 1: 454--455 (1940) and 1: 504. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 17 & 96. 1942; Moldenke, Alph. List Cit. 1: 233. 1946; E. J. Salisb., Ind. Kew. Suppl. 10: 134. 1947; Moldenke, Alph. List Invalid Names Suppl. 1: 14. 1947; Moldenke, Alph. List Cit. 2: 474, 477, & 595 (1948) and 3: 788. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 31 & 191. 1949; Moldenke, Résumé 37, 304, 314, & 463. 1959; Langman, Select. Guide Lit. Flow. Pl. Mex. 515 & 1010. 1964; Moldenke, Phytologia 12: 108, 111, 112, & 363. 1965.

Open-crowned shrub or tree, 1.2--1.8 m. tall; branches and branchlets rather slender, acutely or obtusely tetragonal, sometimes corky-margined, densely puberulent with grayish appressed hairs, less so in age, densely resinous-punctate; nodes annulate; principal internodes 0.5--3.5 cm. long; leaves decussate-opposite; petioles slender, 0.5--1.5 cm. long, varying from densely velutinous when young to merely short-pubescent or strigose and densely resinous-granular; leaf-blades firmly thick-chartaceous, uniformly gray-green on both surfaces or somewhat lighter beneath, very rough-scabrous and bullate above, elliptic or lanceolate, 2.5--9 cm. long, 1--5 cm. wide, acute at the apex, regularly serrulate from almost the base to the apex with small acute antrorse teeth with subrevolute margins, acuminate at the base, pilose above with harsh bulbous-based whitish hairs, densely short-pubescent or tomentellous beneath (velutinous-tomentose when young); midrib slen-

der, mostly impressed above (or appearing as though raised by being more densely pilose), rounded-prominent beneath; secondaries slender, 5--9 per side, arcuate-ascending, impressed above, prominent beneath; veinlet reticulation abundant, impressed above, sharply prominent beneath; inflorescence axillary, paniculate, one panicle and sometimes also 1 or 2 single-headed peduncles issuing from each axil or sometimes only several single-headed peduncles; the simple inflorescences 1--3 cm. long, the panicles to 9 cm. long; peduncles and inflorescence-branches very slender, 1--4.5 cm. long, densely puberulent, short-pubescent, or strigose with cinereous hairs; panicles with 1--3 whorls of capitate branches; heads hemispheric during anthesis, oblong in fruit, densely many-flowered, 3--14 mm. long, 5--10 mm. wide; bractlets large, conspicuous, imbricate in many ranks, persistent, dry and scarious in fruit, reniform, 3--5 mm. long, 4--6 mm. wide, densely puberulent on both surfaces during anthesis, glabrate and prominently venose in fruit; receptacle 3--7 mm. long.

The type of this species was collected by Edward Palmer (no. 1969) at Tepic, Nayarit, Mexico, between January 5 and February 6, 1892, and is deposited in the Britton Herbarium at the New York Botanical Garden. Lantana canescens Benth. is based on Arsène 3243 from Michoacán, Mexico, deposited in the United States National Herbarium at Washington. Humboldt, Bonpland, and Kunth's species of the same name is a valid species in Lantana.

Standley identified the type of Lippia tepicana as Lantana involucrata L., noting that "the Mexican form differs somewhat from the West Indian, but not consistently". To this Britton has appended his comment "But this is not the West Indian plant!"

Lippia tepicana has been found on grassy slopes with scattered shrubbery on hills, at altitudes of 1325 to 2800 meters, flowering in January, February, May, and November, fruiting in February, March, and May. Gentry & Gilly found it "in highly mixed tropical forest dominated by pine and oak on mountain slopes with clay soils volcanically derived" in Nayarit. Material has been misidentified and distributed in herbaria under the names L. callicarpaefolia H.B.K., L. pringlei Briq., L. umbellata Cav., Lantana involucrata L., and even Melampodium sp. in the Carduaceae!

In all, 19 herbarium specimens, including the types of all the names involved, have been examined by me.

Citations: MEXICO: Jalisco: H. S. Gentry 5353 (Fs, N). Michoacán: Arsène 3243 (W--1000868). Nayarit: DeLeon 1618 (Mi), 1629 (Mi); Gentry & Gilly 10484 (Rf); M. E. Jones 23235 (Ca--400873, Po--153924), 23416 (Gg--172647, N, N, Po--191958), 23417 (Po--191959); Edw. Palmer 1969 (Ca--770321--isotype, Cp--isotype, Fs--isotype, Mi--isotype, N--type, S--isotype).

LIPPIA THYMOIDES Mart. & Schau. ex Schau. in A. DC., Prodr. 11: 586--587. 1847.

Synonymy: Lippia ocymoides Mart. & Schau. ex Briq. in Engl. &

Prantl, Nat. Pflanzenfam. 4 (3a): 152, sphalm. 1894.

Bibliography: Schau. in A. DC., Profr. 11: 586--587. 1847; Schau. in Mart., Fl. Bras. 9: 240. 1851; Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 96. 1894; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 152. 1895; Solered., Bull. Herb. Boiss., sér. 1, 6: 628. 1898; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 38 & 96. 1942; Moldenke, Alph. List Cit. 2: 429 (1948) and 3: 691 & 711. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 81 & 191. 1949; Moldenke, Résumé 94 & 463. 1959; Moldenke, Résumé Suppl. 8: 5. 1864; Moldenke, Phytologia 12: 24. 1965.

Subshrub, 1--1.3 m. tall; branches crowded, spreading, virgate, hirtellous-scabrous, with abbreviated axillary branchlets; leaves decussate-opposite, small, 4--6 mm. long, 2 mm. wide, oblong-cuneate, rather acute or obtuse at the apex, entire and revolute along the margins, 1-veined, scabrous above, glandular-pulverulent and somewhat grayish beneath, fasciculate-crowded on the sterile branchlets; heads solitary in the upper leaf-axils, very short-pedunculate, subglobose or oval, compact, about 8 mm. long; bractlets subherbaceous, imbricate, ovate-lanceolate, acute at the apex, 3-veined, glandular-pulverulent on the back, ciliate along the margins, equaling the corolla-tube; corolla rose, yellow in the throat, subinfundibular, glandular-pubescent on the outside; fruit normal for the genus.

This species was based by Schauer on two collections (no. 1955) made by Carl Friedrich Philipp von Martius on the campos and in the woods of the Catingas at Feira de S. Anna and at Maracas, Bahia, Brazil, deposited in the herbarium of the Botanisches Museum at Munich and photographed there by Macbride as his type photograph number 20335. Schauer classified the species in his section Zapania, subsection Axilliflorae. It is known thus far only from the original collections. In all, 4 mounted phototypes have been examined by me.

Citations: BRAZIL: Bahia: Martius 1955 [Herb. Monac. 137; Macbride photos 20335] (It--photo of type, Kr--photo of type, N--photo of type, W--photo of type).

LIPPIA TORRESII Standl., Field Mus. Nat. Hist. Publ. Bot. 18: 1010--1011. 1938.

Synonymy: Lippia torresi Standl., in herb.

Bibliography: P. C. Standl., Field Mus. Nat. Hist. Publ. Bot. 18: 1010--1011. 1938; Moldenke, Alph. List Common Names 7. 1939; Moldenke, Suppl. List Common Names 5. 1940; Moldenke in Woodson & Schery, Ann. Mo. Bot. Gard. 27: 335--336. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 23, 24, & 96. 1942; Moldenke, Phytologia 2: 107. 1945; Moldenke, Alph. List Cit. 1: 7. 1946; E. J. Salisb., Ind. Kew. Suppl. 10: 134. 1947; Moldenke, Phytologia 2: 384. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 86. 1948; Moldenke, Alph. List Cit. 2: 390 (1948), 3: 940 & 945 (1949), and 4: 999--1001. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 39, 41, & 191. 1949; Dayton, Phytologia 4: 259. 1953; Brizicky, Stern, & Chambers, Trop. Woods 109: 78. 1958; Moldenke, Ré-

sumé 47, 48, & 463. 1959; Moldenke, Résumé Suppl. 8: 1. 1964; Moldenke, Phytologia 12: 504. 1966.

Large forest tree, 4--24 m. tall; crown broad, flat or rounded; trunk 15--90 cm. in diameter at breast height; bark neutral gray, brownish, or light-brown to gray-brown, neutral-brown, or dark-brown, moderately striate with raised ridges, rough; wood very hard, the sapwood light, the heartwood dark; cambium layer greenish; branches wide-spreading; young branchlets greenish, acutely angular, roughly quadrate or square, densely hispidulous with short sordid hairs; leaves decussate-opposite, aromatic, with a mint-like odor, rather large, petiolate; petioles slender, 1.5--2.5 cm. long, densely hispidulous; leaf-blades thick and fleshy when fresh, membranous when dry, barely or slightly stiffened or "a little stiffened but soft", bright-green or dark emerald-green above, light- or pale-green to gray-green beneath, not shiny, ovate-oblong, mostly 12--21 cm. long, 6--9 cm. wide, acute or subacuminate at the apex, sharply crenulate along the margins, rather abruptly cuneate-attenuate at the base, scabrous and rugose or very rugose above, sparsely villosulous but soft to touch above and more or less bullate with sharply reticulate veinlets, much paler beneath and densely velutinous-pilose with straight spreading but more or less entwined hairs throughout; midrib slender, prominent beneath; secondaries about 10 per side, arcuate-ascending with a rather broad angle; peduncles axillary, fasciculate, very slender, about 1.5 cm. long, puberulent or densely hispidulous; flowers densely capitate, not fragrant but attracting many insects; heads small, round or flattened, globose and 1 cm. wide when in fruit; bractlets light- or pale-green, violet-purple on the top, glandular, slightly glutinous, membranous and accrescent in the fruiting stage and then much blown by the wind, venose, ciliolate on the margins, otherwise glabrous, broadly rounded at the apex; calyx almost 2 mm. long, densely villosulous; corolla hypocrateriform, yellow, pale-yellow, or light primuline yellow to primrose, greenish-yellow, or lemon-chrome, sometimes greenish-white or white, sometimes lemon-chrome and maturing cream-color, almost completely glabrous on the outer surface, the tube slender, 2 mm. long, the lobes 4 or 5, expanded or reflexed, compressed, about 1 mm. long, puberulent.

The type of this handsome species was collected by Austin F. Smith (no. H.436) at Tapezco de Zarcero, at an altitude of 1950 m., Alajuela, Costa Rica, in March, 1938, and is deposited in the herbarium of the Chicago Natural History Museum. The species is named in honor of Rubén Torres Rojas, Costa Rican naturalist and educator, rector of the national university, noted for his botanical and zoological collecting in Costa Rica. Smith notes that the leaves grow much larger than those on flowering specimens in herbaria and that the flower-heads have the "appearance of rosettes resembling Lantana or a tiny artichoke". The flowers are described as "yellow" on P. H. Allen 1481 and Skutch 4191, "greenish-yellow" on P. H. Allen 1565, "pale-yellow" on Skutch 5467, "light primuline-yellow" on A. F. Smith H.187, "white" on A. F. Smith 83

and Stork 4183, "primrose to pale-yellow or cream-color" on A. F. Smith 1569, "cream" on Lems 5049, and "lemon-chrome maturing to cream-color" on A. F. Smith P.2274. Wood samples of Stork 4590 are deposited in the Lundell and University of Michigan herbaria, and a pollen sample taken from P. H. Allen 1565 is represented in the slide collection of the Harvard University herbarium.

The species has been found in forests and at the edge of forests, in potreros and pastures, in heavy loam or in rich loam and mould, in semi-shade, on brushy slopes, and in the fog zone influence, at altitudes of 1130 to 2300 meters, flowering in January, February, April, June, October, and November, fruiting in January, March, and April. A. F. Smith found it at the "edge of woodland, nearly open exposure in heavy clay-loam soil at upper limit of tropical zone, Pacific watershed.....fairly common component of forest especially in drier parts.....Caribbean cloud forest zone at edge of forest in half-shade in mold and loam soil." Lems found it in "upper montane forest with Quercus copeyensis, Q. costaricensis, and abundant epiphytes."

Vernacular names recorded for it are "caragra", "caragra negra", and "caragre". Material has been misidentified and distributed in herbaria as L. substrigosa Turcz.

In the Harvard University herbarium there are deposited the following specimens identified as L. torresii, but not as yet checked by me: COSTA RICA: San José: E. L. Little 6015 [U. S. Dept. Agr. Forest Serv. 95036] (A). PANAMA: Chiriquí: M. E. Davidson 793 (A), 1356 (A). Standley (1938) also cites the following, not as yet seen by me: COSTA RICA: Alajuela: A. F. Smith H. 187 (F), H.436 (F—type); Standley & Torres Rojas 47937 (F). San José: P. C. Standley 43519 (F).

In all, 26 herbarium specimens have been examined by me.

Citations: COSTA RICA: Alajuela: A. F. Smith 83 [Stork 4183] (Mi), 1569 (N), H.187 (N), P.2274 (A, Ca—12727). Cartago: Lems 5049 (N); Tonduz 1876 (Br). Heredia: Skutch 5467 (W—2351972). San José: Skutch 4191 (A, N, S); Stork 4590 (Ld, Mi); Tonduz 1700 (Br, Br, N), 7843 (Br), s.n. [Herb. Inst. Physico-geogr. Nac. Costaric. 17841] (Br, N). PANAMA: Chiriquí: P. H. Allen 1481 (G, N), 1565 (G, N, N); Stern & Chambers 78 (Bs, Z).

LIPPIA TRACHYPHYLLA Briq., Ann. Conserv. & Jard. Bot. Genève. 7-8: 312—313. 1904.

Synonymy: Lippia trachyphylla Mold. ex Stellfeld, Trib. Farmac. 19 (10): 169, sphalm. 1951.

Bibliography: Briq., Ann. Conserv. & Jard. Bot. Genève. 7-8: 312—313. 1904; Prain, Ind. Kew. Suppl. 3: 104. 1908; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 41 & 96. 1942; Moldenke, Lilloa 8: 426 (1942) and 10: 380. 1944; Moldenke, Alph. List Cit. 1: 27. 1946; Moldenke, Phytologia 2: 336, 337, & 386. 1947; Moldenke, Lilloa 14: 47. 1948; Moldenke, Castanea 13: 118. 1948; Moldenke, Alph. List Cit. 2: 448, 598, & 626 (1948), 3: 693 (1949),

and 4: 1293. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 81, 97, 99, 105, & 191. 1949; Stellfeld, Trib. Farmac. 19 (10): 169. 1951; Angely, Fl. Paran. 7: 12. 1957; Moldenke, Résumé 94, 114, 117, 126, 317, & 463. 1959; Angely, Fl. Paran. 16: 60 (1960) and 17: 46. 1961; Troncoso, Darwiniana 12: 258, 282, & 283, fig. 13. 1961; Troncoso, Bol. Soc. Argent. Bot. 9: 184. 1961; Moldenke, Phytologia 12: 24, 90, & 290. 1965; Moldenke, Résumé Suppl. 12: 4. 1965.

Illustrations: Troncoso, Darwiniana 12: 283, fig. 13. 1961.

Dioecious decumbent herb; stems procumbent, issuing from a hard thick rootstock, diffusely branched; branches dark-green, sparsely strigose above with appressed antrorse hairs; middle internodes 2--5 cm. long; leaves decussate-opposite, medium in size; petioles 3--6 mm. long; leaf-blades rather thick, rigid, dark-green on both surfaces, ovate or ovate-elliptic, 3--4.5 cm. long, 2--2.5 cm. wide, acute or subobtuse at the apex, more convex along the margins below the middle and conspicuously crenate-serrate (the teeth 1--1.5 mm. long and 2--5 mm. apart), broadly rounded-cuneate at the base and prolonged into the petiole, pilose above with small antrorse hairs that are thickened at their base, conspicuously scabrous, appressed-strigose beneath especially on the venation, sparsely so on the lamina; venation prominently penninerved, the midrib lineate above, prominent beneath, the 4 or 5 secondaries anastomosing toward the margins, lineate above, prominent beneath; inflorescence axillary in the upper leaf-axils, pedunculate; peduncles shorter than the subtending leaves, 1--1.5 cm. long, appressed strigose-pubescent, the hairs beneath the head mixed with stipitate glands; heads subspheric, about the size of a large pea (Pisum sativum), to 8 mm. long and 10 mm. wide, grayish; lower bractlets ovate-acuminate, to 5 mm. long, sometimes surpassing the head, densely strigose-canescens on the outside, the rest about equaling or shorter than the flowers; calyx minute, campanulate, hardly 0.5 mm. long, subbilabiate, the lips subentire, pubescent on the outside; corolla hypocrateriform, yellow or rose-violet, exserted, surpassing the calyx-mouth by 3 mm., the tube glabrescent below, pubescent above, the limb pubescent on the outside, the lobes 4, short and ovate, the anterior one longer, to 0.5 mm. long; stamens and pistil normal for the genus, included; mature fruit not known.

The type of this species was collected by Benedict Balansa (no. 4626) on the sandy borders of the Y'-acan-guazu near Valenzuela, Paraguay, in November, 1882, and is deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques at Geneva, where it was photographed by Macbride as his type photograph number 24672.

Briquet (1904) has this to say about this plant: "Espèce très caractérisée, voisine du L. asperrima Cham. dont elle diffère par ses feuilles ovées et petiolées, ses tiges rampantes diffusément rameuses, ses pédoncules plus courts, à indument strigoso-appliqué à glandes stipitées très courtes et localisées sous les capitules, ses corolles d'un rose-violacé (jaunes dans le V. as-

perrima) etc." In speaking of his L. modesta, he says "Cette espèce est à peu près intermédiaire entre le L. asperrima Cham. et le L. trachyphylla Briq. ci-après décrit. Elle est caractérisée par une hétérophylle assez marquée, des feuilles à peine rudes et non pas vraiment scabres et bien moins rugueuses que dans ces deux espèces. L'indument des pédoncules ressemble à celui du L. trachyphylla, mais ceux-ci sont plus allongés et plus tenus. Autant qu'on peut en juger sur le sec, la corolle paraît être jaune comme dans le L. asperrima." If it is really true that L. trachyphylla differs from its relatives in having rose-violet flowers (as stated on the type collection), then the Fries 616, cited below, which is said to have had yellow flowers should be examined again, as it may not be L. trachyphylla after all.

Lippia trachyphylla has been found growing on campos and open dry campos and along river borders, at altitudes of 2385 to 3000 meters, blooming in January, March, October, and November. Material has been misidentified and distributed in herbaria as L. turnerifolia Cham.

The record of L. trachyphylla from Paraná, Brazil, given by me in previous publications, was based on Jönsson 35a, which proves to be L. turnerifolia Cham.

In all, 4 herbarium specimens and 4 mounted phototypes have been examined by me.

Citations: BOLIVIA: Cochabamba: Kuntze s.n. [Tunari, V.92] (N). Province undetermined: Cuming 150 (V). PARAGUAY: Balansa 4626 [Macbride photos 24672] (It—photo of type, Kr—photo of type, N—photo of type, W—photo of type). ARGENTINA: Salta: R. E. Fries 616 (S); T. Meyer 4610 (Ca—906139).

LIPPIA TRISTIS Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1161. 1904.

Synonymy: Lippia tristis var. normalis Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1161. 1904. Lippia angustifolia Chod. ex Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1159, in syn. 1904 [not L. angustifolia Cham., 1832, nor Cham. & Schlecht., 1947, nor H.B.K., 1947, nor Morong, 1904, nor Schau., 1959]. Lippia turneraefolia Chod. ex Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1159, in syn. 1904 [not L. turneraefolia Cham., 1851]. Lippia turnerifolia Chod. ex Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1159, in syn. 1904 [not L. turnerifolia Cham., 1832]. Lippia tristis var. tristis Troncoso, Darwiniana 12: 284. 1961.

Bibliography: Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1159--1161. 1904; Briq. in Chod. & Hassler, Pl. Hassler. 2 (11): 495 & 496. 1904; Prain, Ind. Kew. Suppl. 3: 104. 1908; Moldenke, Lilloa 5: 429. 1940; Moldenke, Suppl. List Invalid names 6. 1941; Moldenke, Lilloa 8: 426. 1942; Moldenke, Alph. List Invalid Names 32. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1],

41 & 96. 1942; Moldenke, Alph. List Cit. 1: 263 (1946) and 2: 600. 1948; Moldenke, Lilloa 14: 47. 1948; Moldenke, Alph. List Cit. 3: 693. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 99 & 191. 1949; Moldenke, Résumé 117, 318, & 463. 1959; Troncoso, Darwiniana 12: 258, 259, 267, 283--285, & 287, fig. 14. 1961; Troncoso, Bol. Soc. Argent. Bot. 9: 184. 1961; Moldenke, Phytologia 12: 24 & 139. 1965; Moldenke, Résumé Suppl. 12: 10 & 11. 1965. Illustrations: Troncoso, Darwiniana 12: 284, fig. 14. 1961.

Medium-sized subshrub, 20--60 cm. tall, dioecious, with a woody tuberous caudex; aerial stems erect, strict, simple or subsimple, obtusely tetragonal or subterete, green, often nigrescent above in drying, more or less strigose-pilose with antrorse hairs, longer spreading hairs interspersed among them (sometimes abundant, sometimes few); leaves decussate-opposite, dimorphic, sessile or subsessile; lower leaf-blades green, oval to ovate or ovate-subrotund, small, obtuse at the apex, the upper cauline ones narrow-lanceolate to lanceolate or elliptic-lanceolate, larger, 3--6 cm. long, 0.5--1 cm. wide, acute at the apex, entire or subentire along the margins, rounded-extenuate at the base, strigose-pilose or substrigose on both surfaces with small antrorse hairs, sometimes roughened, with longer spreading and glandulose hairs usually present, often nigrescent (especially above) in drying, 3- or 5-plinerved at the base, sometimes rugose above because of the beautifully reticulate venation which is conspicuously prominent beneath, not punctate beneath; inflorescence axillary, pedunculate; peduncles surpassing the lower leaves, about equaling (rarely much longer than) the upper ones, slender, strigose-pilose with antrorse hairs and often also glandular-pilosulous; heads ovate to ovoid-subglobose, about 5 mm. long and wide during anthesis, 10 mm. long and wide in fruit; exterior bractlets green, elliptic-lanceolate and 3 mm. long by 1.5 mm. wide during anthesis, broadly ovate and 5--6 mm. long by 3 mm. wide after anthesis, acuminate at the apex, slightly surpassing the heads and easily becoming nigrescent in drying, the inner ones reduced and narrower, all strigose or substrigose with antrorse hairs and more or less glandular-pilosulous, about equaling the flowers; calyx during anthesis very small, hardly over 0.5 mm. long, pubescent on the outside, obscurely subbilabiate, the lips subentire; corolla hypocrateriform, yellow or lemon-yellow, small, densely puberulent on the outside, surpassing the calyx by about 2 mm., the tube exserted, the lobes rounded, about 0.5 mm. long, the anterior one larger; stamens and pistil normal for the genus, included; mericarps densely white-tomentose (like to calyx-segments) outside, splitting apart with the calyx-segments, about 1.6 mm. long and 1.5 mm. wide, smooth, the inner surface excavated.

This species was based on two collections made in Paraguay by Emil Hassler -- the first (no. 4554) in September in the campo near Carimbatay, and the other (no. 5461, in part, or 5461a) in November in the campo near Igatimi. The former of these has been designated as lectotype of the species by Troncoso and was photographed by Macbride in the Delessert Herbarium at the Conservatoire et Jardin

Botaniques at Geneva as his type photograph number 24674.

Briquet (1904) says: "Cette très remarquable espèce se place dans le voisinage du L. heterophylla. Elle se reconnaît au premier coup d'oeil à ses feuilles triplinerviées ou quintuplinerviées à la base, à nervures très acroscopes. Le L. turnerifolia en diffère toto caelo par la forme des feuilles et la nervation, l'indument des pédoncules, la forme des capitules et des bractées, et les calices non laineux à la maturité. Quant au L. angustifolia, il appartient à un groupe tout différent à capitules disposés en racine terminal, alors que le L. tristis appartient au groupe des Euzapania à capitules axillaires." For his var. normalis he says: "Folia caulinarum superiora lanceolata vel elliptico-lanceolata, superficie 3--6 x 0,5--1 cm. Pedunculi inferiores folia superantes, superiores laminam circiter aequantes. Caulis et folia pilis strigosis et aliis longioribus patulis praedita." He also states that it is related to L. coriacea Briq. In the Instituto Miguel Lillo the original bibliographic references for this species and its trinomial synonym are given as "Plantae Hasslerianae XI (1904) 495 & 496".

The plant has been found growing in fields and on campos, flowering in September and November. Troncoso (1961) says: "Especie basada en los sintipos Hassler 4554 y 5461a. Debe considerarse como lectotipo Hassler 4554, por figurar en la serie de fototipos del Museo de Chicago. Especie dioica. Ha dibujado las flores ♂ del ejemplar Hassler 4554 pero el mismo ejemplar posee individuos ♀. Lamentablemente el material fue devuelto a Ginebra antes de haber observado el carácter dioico del mismo. La bráctea fructífera dibujada, anchamente oval, y la observación del fototipo, (los dos ejemplares del centro son ♀, los de los costados ♂) me permiten afirmarlo. El sintipo Hassler 5461a es un individuo ♂. Sus flores son tempranamente caducas por falta de fecundación, el cáliz falta o se halla reducido a dos diminutas escamitas membranáceas, de no más de 0,5 mm, que quedan adheridas al raquis floral a ambos lados del punto de inserción de la corola; ésta es infundibulariforme, ensanchada en el lugar de inserción de los estambres, su gineceo aunque presente es abortivo.

"Como al describir la especie, Briquet da caracteres de sus dos variedades: var. normalis y var. aberrans, considero necesario redescribirla en base exclusivamente al lectotipo Hassler 4554, tanto más cuanto la var. aberrans pasa a ser una especie afin pero diferente.

"Sufrútice perenne dioico, de 30--40 cm de alt., rizoma tuberoso-leñoso, grueso, que emite numerosos tallos aéreos, erectos, delgados, subcilíndricos, subestriados, verdes, que al secarse ennegrecen en el ápice, con largos pelos extendidos y pelos estrioso mezclados con pelitos glandulosos, breves, más abundantes hacia el ápice de los tallos. Hojas opuestas, dimorfas, las inferiores pequeñas, ovales a oval-redondeadas o espatuladas, de 0,3--0,8 x 0,5--1 cm de lat. y long., subsésiles, enteras o con un

diente hacia el ápice, las superiores mayores, lanceoladas, agudas, atenuadas hacia la base, subsésiles, de 0,5--0,8 X 2,5--5 cm de lat. y long. respect., enteras o con 1--2 dientes en el ápice, de borde recurvo, ennegreciendo al secarse, principalmente hacia la base, 3-plinervias, nervaduras paralelas prominentes y lámina marcadamente reticulada-venosa en el envés, con pelos rígidos, subestrigosos sobre los nervios y retículos pubescentes o glanduloso-pubescentes a subglabros; pelos extendidos, callosos en la base en el haz, particularmente sobre el borde. Capítulos axilares, subglobosos, solitarios (rara vez 2 por axila), largamente pedunculados, pedúnculos delgados, filiformes, de 2--5 cm de long., los inferiores más largos (4--5 cm), los superiores más breves igualando las hojas, hispídos y con pelitos breves, glandulosos, más densos hacia el ápice. Flores diclinas, las masculinas con brácteas elíptico-lanceoladas, de 3,5--4 X 0,5--0,7 cm de long. y lat., de igual longitud que las flores o poco más breves, hispídas y glanduloso-pilosas hacia el ápice; cáliz diminuto, difilo, pronto caduco, membranáceo, glabro o ligeramente pubescente; corola citrina o amarilla (según el autor), infundibulariforme, bilabiada, labio anterior 3-lobado, lóbulos redondeados, lóbulo posterior más pequeño, tubo breve, pubescente exteriormente; estambres 4, didínamos, subsésiles, inclusos, insertos en la porción superior del tubo corolar. Gineceo de la flor ♂ aparentemente normal pero abortado funcionalmente (las flores caen sin fructificar). Flores ♀ no vistas. Fruto (según Briquet) es quizocárpico, separable espontáneamente en 2 mericarpios cubierto por el cáliz acrescente, densamente albo-tomentoso, de superficie dorsal lisa, convexa y cara interna excavada." She cites Hassler 4554 (Cb--cotype) and 5461a (X--cotype).

It should be noted here that the names L. angustifolia Cham. & Schlecht., L. angustifolia H.B.K., and L. angustifolia Schau. are all synonyms of the valid L. angustifolia Cham., while L. angustifolia Morong is a synonym of the valid L. morongii Kuntze; L. turneraefolia Cham. is a synonym of the valid L. turnerifolia Cham.

In all, 4 herbarium specimens and 4 mounted photographs, including type material of most of the names involved, have been examined by me.

Citations: PARAGUAY: Hassler 4554 [Macbride photos 24674] (Ca--944354--cotype, It--photo of cotype, Kr--photo of cotype, N--cotype, N--cotype, N--photo of cotype, S--cotype, W--photo of cotype).

LIPPIA TRISTIS var. ABERRANS Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1161. 1904.

Synonymy: Lippia aberrans (Briq.) Troncoso, Darwiniana 12: 258 & 267--268, fig. 5. 1961.

Bibliography: Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1161. 1904; Briq. in Chod. & Hassler, Pl. Hassler. 2 (11): 496. 1904; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 41 & 96 (1942) and [ed. 2], 99 & 191. 1949; Moldenke, Résumé 117 & 463. 1959; Troncoso, Darwiniana 12: 258, 259, 267--268, fig. 5, & 285. 1961; Troncoso, Bol. Soc. Argent. Bot. 9: 184. 1961; Mol-

denke, Résumé Suppl. 5: 7. 1962; Moldenke, Phytologia 12: 24. 1965.

Illustrations: Troncoso, Darwiniana 12: 268, fig. 5. 1961.

This variety differs from the typical form of the species in having its pubescence on the stems, leaves, and peduncles only strigose, the peduncles 2--3 times as long as the subtending leaves, 7--12 cm. long, and the leaf-blades narrow-lanceolate, pellucid-punctate on the lower surface, with the lateral veins hardly visible. It is said to grow 50 cm. tall, to be dioecious, and to have yellow corollas, inhabiting burned campos, flowering in March. At the Instituto Miguel Lillo the original bibliographic reference is cited as "Plantae Hasslerianae XI (1904) 496."

The type of the variety was collected by Emil Hassler (no. 5461) on the campo near Igatimi, Paraguay, in November, 1898, and is deposited in the Delessert Herbarium at the Conservatoire et Jardin Botaniques at Geneva.

Troncoso (1961) says: "Briquet identificó el ejemplar Hassler 5461 pp. como L. tristis var. aberrans. El estudio del ejemplar tipo del Herbario de Ginebra me permite afirmar que se trata de una especie bien diferente de L. tristis. Difiere de esta especie por sus larguísimos pedúnculos que sobrepasan 2 a 3 veces la longitud de las hojas (7--12 cm de long.), por sus hojas angostamente lanceoladas, con nervios laterales poco visibles y con puntos pelúcidos en el envés de la lámina. L. tristis posee dimorfismo foliar con hojas inferiores ovales, muy pequeñas, obtusas, las superiores angostamente lanceoladas y mayores; nervaduras marcadamente prominentes en el envés, lámina reticulado-venosa y sin puntos pelúcidos. Además la pubescencia es muy diferente, exclusivamente estrigosa en tallos, hojas y pedúnculos en L. aberrans; pelos subestrigosos, pelos largos extendidos y pelitos breves, glandulosos en L. tristis (ver fig. 14). Por todos estos caracteres diferenciales considero que la variedad aberrans debe pasar a constituir una nueva especie.

"L. aberrans es una especie dioica, consistuyendo el ejemplar Hassler 5461 del herbario del Ginebra el individuo femenino (ver figs.). Rojas 5268, aunque algo mayor en el porte, representaría el individuo masculino." She cites from Paraguay: Hassler 546 (Cb--type), 9117 (Bm, Cb); T. Rojas 5268 (Si), not as yet seen by me.

In all, 5 herbarium specimens, including type material of both names involved, and 2 mounted photographs have been examined by me.

Citations: PARAGUAY: Hassler 5461 (N--isotype); Jørgensen 4583 (Cp, N, N, N--photo, S, Z--photo).

LIPPIA TROLLII Moldenke, Phytologia 6: 446--447. 1959.

Bibliography: Moldenke, Phytologia 6: 446--447. 1959; Moldenke, Biol. Abstr. 33: 1862. 1959; Moldenke, Résumé 425 & 463. 1959; Moldenke, Résumé Suppl. 1: 7. 1959; Hocking, Excerpt. Bot. A.5: 44. 1962.

Shrub; branches rather slender, gray, decidedly tetragonal, gla-

brесcent, pithy; branchlets and twigs very slender, tetragonal, very densely short-pubescent, often more or less aculeate with scattered thorns; nodes not annulate; principal internodes 1--2.5 cm. long; leaves decussate-opposite; petioles very short, usually 1--3 mm. long, densely white-pubescent; leaf-blades thin-chartaceous, rather dark-green above, much lighter beneath, elliptic or ovate, 2--3.8 cm. long, 1.1--2.1 cm. wide, acute or subacute at the apex and base, regularly serrate from near the base to the apex with appressed antrorse teeth, rather sparsely pubescent above with somewhat bulbous-based hairs, very densely pubescent beneath; midrib slender, plane or subimpressed above, prominulous beneath; secondaries filiform, 4--8 per side, ascending, not much arcuate, mostly terminating in the sinuses between the teeth, slightly impressed above, slightly prominulous beneath; veinlet reticulation indiscernible above, obscure or indiscernible beneath; inflorescence terminal, forming a simple or compound raceme 5--9 cm. long and 2--4 cm. wide; peduncles slender, tetragonal, about 2 cm. long, densely short-pubescent like the twigs; rachis slender, tetragonal, densely short-pubescent; bracts foliaceous, similar to the uppermost leaves but smaller, narrow-elliptic, 4--15 mm. long, 1--5 mm. wide, densely short-pubescent with whitish hairs, one pair at each node of the rachis; individual heads 2 or 3 per node, many-flowered, very dense, 7--9 mm. long, about 7 mm. wide, on very slender secondary peduncles 5--6 mm. long and densely whitish-villosulous; bractlets elliptic or elliptic-lanceolate, about 4 mm. long, 1.5--2 mm. wide, acute at the apex, usually more or less falcate and conduplicate, scattered-pilosulous with rather stiff whitish hairs, more densely so on the margins; calyx minute, densely villous; corolla hypocrateriform, its slender tube about 4 mm. long, the limb 2 mm. wide, glabrous on the outside, barbulate in the throat within; fruit not seen.

The type of this distinctive species was collected by Karl Troll (no. 1207) -- in whose honor it was named -- at Vallegrande, Santa Cruz, Bolivia, at an altitude of 1900 meters, on January 28, 1928, and is deposited in the herbarium of the Botanisches Museum at Berlin. The species has been found at altitudes of 1500 to 1900 meters, flowering in January.

In all, 3 herbarium specimens, including the type, have been examined by me.

Citations: BOLIVIA: Santa Cruz: Troll 1054 (B), 1207 (B--type, Z--isotype).

LIPPIA TURBINATA Griseb., Abhand. Kaiser. Gesell. Wiss. Götting. 19: 243. 1874.

Synonymy: Lippia disepala R. A. Phil., Anal. Univ. Chile 90: 622. 1895. Lippia aprica R. A. Phil., Anal. Univ. Chile 91: 415. 1896. Lippia globiflora var. microphylla f. glabriuscula Kuntze, Rev. Gen. Pl. 3 (2): 252. 1898. Lippia microphylla f. glabriuscula Kuntze ex Moldenke, Prelim. Alph. List Invalid Names 31, in syn. 1940. Lippia poleo Lillo ex Moldenke, Suppl. List Invalid

Names 6, in syn. 1941. Lippia poleo var. angustifolia Lillo ex Moldenke, *Résumé Suppl.* 10: 6, in syn. 1964.

Bibliography: Griseb., *Abhand. Kaiser. Gesell. Wiss. Götting.* 19: 243. 1874; Lorentz, *Veg. Nordeste Prov. Entre Rios*, ed. 1, 150. 1878; Griseb., *Abhand. Kaiser. Gesell. Wiss. Götting.* 24: [Symb. Fl. Argent.] 278. 1879; Lillo, *Fl. Tucuman* 94. 1888; Jacks. in Hook. f. & Jacks., *Ind. Kew.* 2: 96. 1894; R. A. Phil., *Anal. Univ. Chile* 90: 622 (1895) and 91: 415. 1896; Kuntze, *Rev. Gen. Fl.* 3 (2): 252 & 253. 1898; Durand & Jacks., *Ind. Kew. Suppl.* 1: 250. 1903; Hayek in Engl., *Bot. Jahrb.* 42: 166. 1908; Tavares, *Broter. Zool.* 13: 97—98, pl. 3, fig. 1—5. 1915; Alvarez, *Fl. Santiago del Estero* 106. 1919; Sanzin, *Anal. Soc. Cient. Argent. Buenos Aires* 88 (i—iv): 102. 1919; Doming., *Mat. Med.* 117. 1928; Seckt, *Fl. Cordob.* 418. 1929—1930; Stapf, *Ind. Lond.* 4: 125. 1930; Seckt, *Rev. Univ. Nac. Cordoba* 17: 90. 1930; Houard, *Zoocéd. Pl. Amer. Sud* 350, fig. 814—818 b—f. 1933; Parodi, *Rev. Argent. Agron.* 1: 201. 1934; Latzina, *Trab. Inst. Bot. & Farm. Buenos Aires* 54: 112. 1935; Troncoso, *Darwiniana* 3: 52. 1937; Latzina, *Lilloa* 1: 189. 1937; Monticelli, *Lilloa* 3: 357. 1938; Moldenke, *Premin. Alph. List Invalid Names* 31. 1940; Moldenke, *Suppl. List Common Names* 17. 1940; Moldenke, *Lilloa* 5: 429—431. 1940; Moldenke, *Suppl. List Invalid Names* 5 & 6. 1941; Moldenke, *Known Geograph. Distrib. Verbenac.*, [ed. 1], 35, 42, 43, 73, 95, & 96. 1942; Moldenke, *Alph. List Invalid Names* 30—32. 1942; Moldenke, *Lilloa* 8: 426—427 (1942) and 10: 343—344 & 380. 1944; Covas & Schnack, *Darwiniana* 7: 86. 1945; P. I. Acuña, *Catalog. Fl. Catamarq.* 17. 1945; Moldenke, *Phytologia* 2: 85 & 107. 1945; Moldenke, *Alph. List Cit.* 1: 73, 95, 96, 124, 241, & 266. 1946; Moldenke, *Lilloa* 12: 148 & 149. 1946; Moldenke, *Alph. List Invalid Names Suppl.* 1: 14. 1947; Lorentz, *Veg. Nordeste Prov. Entre Rios*, ed. 2, 150. 1947; Cozzo, *Revist. Argent. Agron.* 14: 252. 1947; Moldenke, *Phytologia* 2: 338 (1947) and 2: 481. 1948; Moldenke, *Lilloa* 14: 47—48. 1948; Moldenke, *Alph. List Cit.* 2: 355, 368, 369, 373, 376—378, 380, 381, 383, 426, 440—442, 535, 537, 574, 585, 593, 598, 600, & 627 (1948), 3: 662, 672, 673, 691, 732—735, 746, 766, 804, 838, 859, 861, 863, 864, 880, 896, 909, 912, & 913 (1949), and 4: 1077, 1088, 1089, 1091, 1092, 1115, 1148, 1214, & 1302. 1949; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 73, 101, 105, 162, 189, & 191. 1949; H. N. & A. L. Moldenke, *Anal. Inst. Biol. Mex.* 20: 10. 1949; Moldenke, *Phytologia* 3: 304 & 305. 1950; Acevedo de Vargas, *Bol. Mus. Nac. Hist. Nat. Chile* 25: 45. 1951; Troncoso, *Darwiniana* 10: 80—83. 1952; Moldenke, *Phytologia* 5: 96. 1954; Acevedo de Vargas, *Biol. Abstr.* 28: 904. 1954; Hocking, *Dict. Terms Pharmacog.* 165. 1955; Moldenke, *Résumé* 84, 121, 126, 220, 310, 312, 314, 316, & 463. 1959; Muñoz Pizarro, *Espec. Plant. Descr. Philippi* 110. 1960; Moldenke, *Résumé Suppl.* 10: 4 & 6 (1964), 11: 5 & 7 (1964), and 12: 5. 1965; Moldenke, *Biol. Abstr.* 46: 3246. 1965; Moldenke, *Phytologia* 12: 26, 47, 61, 63, 196, 218, 219, & 288. 1965.

Illustrations: Tavares, *Broter. Zool.* 13: 97—98, pl. 3, fig. 1—5. 1915; Sanzin, *Anal. Soc. Cient. Argent. Buenos Aires* 88 (i—iv): 102. 1919; Houard, *Zoocéd. Pl. Amer. Sud* 350, fig. 814—818

b--f. 1933.

Shrub, 0.4--2 m. tall, canescent or glabrous, much-branched, very aromatic; branches erect, virgate, terete or obscurely tetragonal, 23--30 cm. long, often about 2 mm. in diameter, subglabrate, sometimes crowded at the apex of a very short woody stem to 5 mm. in diameter; internodes 3--4 times as long as the leaves; leaves mostly ternate, sometimes decussate-opposite, very aromatic, caducous; petioles short; leaf-blades erect or reflexed, lanceolate or oblanceolate, 1.8--2 cm. long, 5--6 mm. wide, acute at the apex, appressed crenate-serrate along the margins, sometimes entire below and with about 3 teeth per side above, narrowed and attenuate into the petiole at the base, penninerved, strigillose, the setose hairs near and on the margins with a tubercle or broad white scale at the base, flat and lineate above, glandular-roughened beneath, the venation prominent or very prominent beneath, impressed (often deeply) above; inflorescence axillary, short, abundant, single in each axil, subequaling or slightly shorter than the subtending leaves or only $1/4$ to $1/3$ as long, subinvolute; peduncles equaling the heads in length, very shortly appressed-pubescent; heads subglobose, 5--7 mm. wide; bractlets rhombic-subrotund or broadly ovate to obovate, flat, acuminate or long-acuminate at the apex, closely imbricate, strigose-puberulent, equaling or surpassing the corolla-tube, the lower ones 3--4 mm. long and 2 mm. wide; flowers very fragrant; calyx diphyllous, the sepals ovate-lanceolate, hispid with spreading setae, keeled, the keel lanate-ciliate; corolla small, hypocrateriform, violet, lilac, or wine-color to purplish-white, white-lilac, or white, about 5 mm. long, the tube about twice as long as the calyx, the limb regular, 2.5 mm. wide.

The type of this common species was collected by Paul Gttnther Lorentz (no. 86) at Estancia Germania, near Córdoba, Córdoba, Argentina, between June and September, 1874, and is deposited in the herbarium of the Botanisches Museum at Munich, where it was photographed by Macbride as his type photograph number 20336. The type of L. aprica was collected by Ezechiél Allende in either Tacna, Chile or Peru ["Ab orn. Ezechiél Allende e provinciis borealibus chilensibus vel et australi peruviae allata"] and is deposited as sheet number 54813 in the herbarium of the National Museum of Chile. The type of L. disepala was collected by August Figueroa in the Andes of Jorquera, Atacama, Chile, sent to Philippi by Manuel Serrazzi, and deposited as sheet number 54814 in the herbarium of the National Museum of Chile. The type of L. globiflora var. microphylla f. glabriuscula was collected by Paul Gttnther Lorentz and Georg Hans Emmo Wolfgang Hieronymus (no. 373) at La Florida, along the Río de la Tala, Catamarca, Argentina, on February 3, 1873, and is deposited in the Britton Herbarium at the New York Botanical Garden.

Philippi (1895) says for his L. disepala: "Parece que las dos cocas del fruto no se separan en la madurez, pero no tanto frutos bien maduros. -- ¿Seria acaso la L. asperifolia Rich., planta comun cerca de Córdoba, i en varias partes del mundo? La muestra

difiere de la descripción de esta especie dada por Schauer....por sus tallos lisos, no erizados, los pedúnculos bastante gruesos, no filiformes, las cabezuelas, que no muestran apariencia de hacerse cilíndricas-ovóideas, las brácteas casi lampiñas, i el cáliz; pero Schauer no dice nada de este órgano." He also says (1896) for his *L. aprica*: "Tenemos también un densísimo césped de ramos nuevos del largo de 13 milímetros, que necen de un cortísimo tronco leñoso del grueso de 5 milímetros, i que no presentan traza de querer florecer."

The length of pistil in relation to the size of the pollen in this species is discussed by Covas & Schnack (1945). *H. H. Bartlett* 20181 has its leaves quite narrow and may actually represent *f. angustifolia* Osten. The flowers are described as "violet" on *Venturi* 609 & 4292; "lilac" on *Cuezzo* 25; "purplish-white" on *T. Meyer* 3735; "white-lilac" on *Cuezzo* 978; "white and wine-color" on *Monetti* 143; and "white" on *Brizuela* 581, *I. M. Johnston* 4987, *T. Meyer* 4190 & 4235, *Ruiz Huidobro* 3043, *Schreiter* s.n., *A. G. Schulz* 2891, *Sparre* 1198, *Terribile* 647, and *Venturi* 2361 & 8120. *Houard* (1933) describes insect galls produced on this plant by two unidentified species of cecidomyids.

Lippia turbinata has been found growing on hard dry ground, dry cultivated ground, uncultivated land, campos, dry barren semi-deserts, hillsides and low hills, river playas, llanuras, in hedges and dry hedges, dry brushwood, dry river valleys, and woods along rivers, at the edges of rivers, and along streams and roadsides, at altitudes of from 70 to 2500 meters, flowering from October to June, and fruiting from November to March. *Jørgensen* refers to it as "abundant" in Catamarca, *Hunziker* calls it "frequent" in Salta, while *Schulz* reports it "abundant in fertile soil in valley" in the same province. *Villafañe* refers to it as "arbusto coposo" in Córdoba, while *Johnston* says "local in dryish meadows" in Atacama. Vernacular names reported for it are "Argentine pennyroyal", "poleho", "poleo", "poles", "polio", "té del país", and "té del país". *Di Lullo* and *Meyer* both aver that it is a medicinal plant. *Parodi* (1934) says "Arbusto achaparrado, de hojas muy aromáticas y caducas, originario de las sierras de Córdoba. Su fama de planta medicinal y la facilidad de multiplicarse por gajos y semillas, ha permitido la difusión de su cultivo, aunque en escasa proporción, por los amantes de la medicina casera." *Troncoso* (1937) says "La he visto escasamente cultivada en algunos jardines. La infusión de sus hojas es utilizada medicinalmente. Originaria de las sierras de Córdoba. Bs. Aires: no. 83 (ex. cult. in Hort. Bot. Fac. Agr. Bs. As.)." *Monticelli* (1938) says "se la cultiva en muchas partes, aun en Buenos Ayres."

In the Instituto Miguel Lillo the original bibliographic references for *L. aprica* and *L. disepala* are given as "Philippi, Plantas nuevas (1896) 416 & 622" -- both references are sometimes cited as "1895", sometimes as "1896". The *Latzina* reference is written as "Latzina, Index II (1937) 189", the *Sanzin* reference as "Sanzin, Verbenaceae (1919) 102", and the *Cozzo* reference as "Cozzo, Raices

gemiferas (1947) 252."

Material has been misidentified and distributed in herbaria under the names L. alba (Mill.) N. E. Br., L. asperifolia Rich., L. geminata Kunth, L. geminata var. microphylla Griseb., and L. nodiflora Michx.

On the other hand, the Galandier s.n. [Córdoba, 2.I.1880], Hieronymus s.n. [Río Córdoba, 12.XI.1877], Lorentz s.n. [Córdoba, 2/I/80], T. Meyer 13015, 13329, 13436, & 13549, Rufz Huidobro s.n. [Barrio Mirador, 19-IV-1944], Scala 201, and Villafañe 681, distributed as L. turbinata, are actually f. angustifolia Osten, while H. H. Bartlett 19678 & 19778, Brizuela 237, 810, & 1217, Herb. Inst. Miguel Lillo 32086, Herb. Mus. Argent. Cienc. Nat. 25/1674 & 23810, Herrero 72, Lorentz & Hieronymus 236, Luna Risso 196, T. Meyer 3495, Monetti s.n. [Leal, Las Lecinas, 28.V.1913], Rodriguez 212, and Venturi 655, 2429, 2683, 3799, 4288, 8115, 8120, 8518, and s.n. [Agua Caliente, 2.IV.1925] are all f. magnifolia Moldenke.

In all, 195 herbarium specimens and 5 mounted photographs, including type or phototype material of all the names involved, have been examined by me.

Citations: CHILE: Atacama: Figueroa s.n. [Herb. Mus. Nac. Chile 54814] (N--photo); I. M. Johnston 4987 (S, W--1497728); Ricardi & Marticorena 3744/132 (Ac); Werdermann 474 (Ca--278556, Gg--123382, S, W--1470923). Tacna: Allende s.n. [Herb. Mus. Nac. Chile 54813] (N--photo). ARGENTINA: Buenos Aires: Hauman s.n. [Sierra de la Ventana, Avril 1908] (Br). Catamarca: Ahumada 64 (N); Brizuela 19 (N), 382 (N), 451 (N, S), 528 (N), 541 (N, Rf), 581 (N), 744 (Au--121215, N), 780 (N, Ok), 880 (N, Ur), 975 (N), 987 (N), 1013 (N, S), 1083 (N, S), 1220 (N), 1252 (N); Castellanos s.n. [Herb. Mus. Argent. Cienc. Nat. 30/604] (N); Hauman s.n. [Herb. Mus. Argent. Cienc. Nat. 23860] (N); Jørgensen 1024 [Herb. Inst. Miguel Lillo 32080; Herb. Osten 11424] (Ca--202220, N, N, Ug, W--704750), s.n. [Andalgala, Nov. 1916; Herb. Fac. Cienc. Med. Buenos Ayres 1024] (Sp--25782); Lorentz & Hieronymus 373 (N); Moldenke & Moldenke 19732 (Es, Lg, N); Pierotti s.n. [18/2/44] (Ca), s.n. [12-III-1944] (W--1931734); Quintero 65 (N); Villafañe 1147 (N). Chaco: T. Meyer 8759 (N); Ragonese 8 [Herb. Mus. Argent. Cienc. Nat. 13345] (N); A. G. Schulz 1488 (N), 6389 (Z). Córdoba: Balegno 961 (N); H. H. Bartlett 19237, in part (W--1904407), 20181 (Mi, W--1904876); Burkart 20411 (Ca--86378); Castellanos s.n. [Herb. Mus. Argent. Cienc. Nat. 31197] (N); Job 554 (N, N); Kuntze s.n. [Córdoba, XII.1891] (W--701567); Lorentz 86 [Macbride photos 20336] (Br--isotype, Kr--photo of type, N--photo of type, W--photo of type); Nicora 378 (N); O'Donell 4433 (N), 4570 (N, Vi); O'Donell & Rodriguez Vaquero 242 (Ca--166091); Pierotti 5121 (N); Rodrigo 278 (N, S), 2184 (N, N); Sota 1483 (Au--121214), 3166 (Gg--410923);

Sparre 1379 (S); Terribile 647 (N), 692 (N, S); Varela 408 (W—1934177); Villafañe 4 (N, N, St), 69 (N). Entre Ríos: Lorentz s.n. [Concepcion del Uruguay, 1880] (W—1233642). La Rioja: Castellanos s.n. [Olta, Feb. 25, 1940; Herb. Mus. Argent. Cienc. Nat. 33898] (N); Cuezzo 978 (N, Ok, Rf); Gómez s.n. [Herb. Mus. Argent. Cienc. Nat. 28/775] (N); T. Meyer 4190 (Ca—77184, Ca—164777), 4235 (Ca—77199, N, N); Varela 769 (Ca, N). Mendoza: Covas 15046 (N); A. Ruiz s.n. [Herb. Mus. Argent. Cienc. Nat. 23928] (N); Ruiz Leal 1142 (N), 4358 (N), 4490 (N), 6754 (N); Sanzin 1832 [Herb. Osten 12799] (Ug). Salta: Castellanos s.n. [Herb. Mus. Argent. Cienc. Nat. 14814] (N); Correa 5 [Herb. Inst. Miguel Lillo 37041] (Au, Ca—155116, N); Garolera & Romero s.n. [Cuesta del Obispo, 21-I-1947] (N); Hunziker 978 (W—1804058); Lorentz & Hieronymus 373 (W—281544); Lourteig 1031 (N); Malvarez 176 (N); T. Meyer 3048 (N), 3447 [Herb. Inst. Miguel Lillo 17335] (N), 3448 [Herb. Inst. Miguel Lillo 35570] (En), 3453 [Herb. Inst. Miguel Lillo 35571] (N), 3726 [Herb. Inst. Miguel Lillo 35473] (N), 3735 [Herb. Inst. Miguel Lillo 35482] (Ca—882510, N), 12409 (N, S); Moldenke & Moldenke 19738 (Es, Lg, N, Sm); O'Donnell 2514 (Ca—165621), 2548 (Ca—164813); Ruiz Huidobro 513 (W—1934085); A. G. Schulz 1449 (N), 2891 (N); Sota 162 (N); Sparre 1198 (S, S); Wall & Sparre s.n. [near Salta, 4/12/46] (Ew, Ew, Ew). San Juan: H. Bartlett 19557 (Ca—772029, Mi, N, W—1904563); Castellanos 15205 (W—2198243); Cuezzo 1845 (N). San Luis: Bruch & Carette s.n. [Alto Pencoso, II.1914] (N, N, N); Digilio & Grassi 2017 (N); Ruiz Leal 9104 (N); Varela 715 (N); Yepes s.n. [Herb. Mus. Argent. Cienc. Nat. 29/90] (N). Santiago del Estero: Balegno 55 (Ca—165673, N); Di Lullo 74 [Herb. Inst. Miguel Lillo 110149] (N, W—1934387); P. Garcia 958 (Ca); Lillo 6182 [Herb. Inst. Miguel Lillo 32088] (N); F. Luna 20 (N), 31 (S); Pierotti 8 (N); Ruiz Huidobro 3043 (N, S). Tucumán: Cuezzo 25 (S); Lillo 18826 [Herb. Inst. Miguel Lillo 32077] (N); T. Meyer 3093 (N); Monetti 143 [Herb. Osten 10875] (Ug), 1949 [Herb. Inst. Miguel Lillo 32090] (N, Vi); Peirano s.n. [El Nio, April 29, 1937; Herb. Inst. Miguel Lillo 32831] (N); Rambo 47544 (Rb); D. Rodriguez 1183 [Herb. Inst. Miguel Lillo 32095] (N, N); Schreiter 7962 [Herb. Inst. Miguel Lillo 32616] (N), s.n. [Amaicha, Dec. 1917; Herb. Osten 12190] (Ug), s.n. [Gualinchey to Mal Paso, Dec. 1917; Herb. Osten 12199] (Ug); Sparre 784 (S); Venturi 609 (W—1591226), 1034 (N), 2361 [Herb. Osten 17265] (N, Ug, W—1591253), 4292 (N, N, S, Ug, W—1591439), s.n. [Herb. Mus. Argent. Cienc. Nat. 23813] (N); E. Wall 10 (Ew); Wall & Sparre s.n. [Trancas, 19/11/46] (Ew, Ew, Ew, Ew, Ew, Ew, Ew). CULTIVATED: Argentina: Lanfranchi 704 (N, N). LOCALITY OF COLLECTION UNDETERMINED: Née 93 [Taboga] (Q).

LIPPIA TURBINATA f. ANGUSTIFOLIA Osten ex Moldenke, Lilloa 5: 431. 1940.

Bibliography: Moldenke, Lilloa 5: 431 (1940) and 8: 427. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 43 & 96. 1942; Moldenke, Lilloa 10: 344. 1944; Moldenke, Phytologia 2: 82 & 107. 1945; Moldenke, Alph. List Cit. 1: 95 & 145. 1946; Moldenke, Lilloa 14: 48. 1948; Moldenke, Phytologia 2: 481. 1948; Moldenke, Alph. List Cit. 2: 377, 441, & 537 (1948), 3: 673, 745, 909, & 913 (1949), and 4: 1294. 1949; Moldenke, Phytologia 3: 76. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 105 & 191. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 10. 1949; Ragonese, Revist. Invest. Agric. 5: 72, 83, 85, & 203. (1951) and 6: 70, 75, & 83. 1951; Moldenke, Inform. Mold. Set 51 Spec. 3. 1956; Moldenke, Résumé 126, 425, & 463. 1959; Moldenke, Résumé Suppl. 1: 7 (1959) and 11: 5 & 7. 1964.

This form differs from the typical form of the species in its uniformly very narrow leaves, which, including the petiole, are 1—3 cm. long and only 1—4 mm. wide.

The type of the form was collected by Augusto Gustavo Schulz (no. 1489) in cultivation at Colonia Benítez, Chaco, Argentina, in October, 1933, and is deposited in the Britton Herbarium at the New York Botanical Garden. The collector notes that the plant is medicinal, used in the treatment of stomach troubles and to aid digestion.

Ragonese (1951) describes it as follows: "Arbusto, de hojas opuestas, lanceoladas, estrechas, de 2 a 5 mm de ancho, con el borde aserrado, cubiertas por pelos cortos y rigidos; flores blancas, pequeñas, agrupadas en inflorescencias axilares. A la infusión de las hojas y ramitas de esta especie se le atribuyen propiedades estimulantes y tónicas, siendo muy utilizada en medicina popular. Es originaria de las llanuras y de la región serrana cordobesa." Collectors also describe it as a low shrub or depressed aromatic shrublet or a tree-like shrub to 1.5 m. tall, with white flowers, inhabiting dry fields, streambanks, the edges of arroyos, and fencerows at 390 to 1000 meters altitude, flowering from October to May, and fruiting in December and January. Common names reported for it are "poleo" and "poleo crespo". Hunziker refers to it as "common" in Córdoba, and Hieronymus says "häufig bei Córdoba". Meyer reports it as adventive in alfalfa fields, and notes that it is cultivated for its stomachic properties in the Chaco. The corollas are described as "white" on Cuezco 930, Lossen 221, Luna 31, Ragonese 6241, and Villafañe 181, 489, 611, & 717.

Material has been misidentified and distributed in herbaria as typical L. turbinata Griseb. and under the name Lippia nodiflora Rich.

In all, 76 herbarium specimens, including the type, and 2 mounted photographs have been examined by me.

Citations: CHILE: Atacama: Ricardi & Marticorena 3645/33 (Ac); Werdermann 484 (N). ARGENTINA: Chaco: T. Meyer 677 [Herb. Osten 22705] (Ug). Córdoba: Balegno 330 (Ca--166170), 1122 (Au--121213,

N); H. H. Bartlett 19237, in part (Mi), 20112 (Mi); Capitanelli s.n. [Ruiz Leal 15972] (Ss); Castellanos s.n. [Villa Brochero, Nov. 12, 1927; Herb. Mus. Argent. Cienc. Nat. 11672] (N); Cuezzo 930 (N); G. Dawson 78 (N, N); Escalante 37 (W--1987974); Galandier s.n. [Córdoba, 2.I.1880] (Br); Gillies s.n. [Province of Cordova] (Lu); Herb. A. Gray s.n. [Cordova, 1872] (C); Herb. Mus. Hist. Nat. Montev. 9604 (Ug); Hieronymus s.n. [Río Córdoba; 12.XI.1877] (Br, N--photo, Sp--25786, Sp, W--281543, W--1177974, Z--photo); J. H. Hunziker 1291 (N); Kuntze s.n. [Córdoba, XII.91] (N); Lorentz s.n. [Córdoba, 2.I.80] (N, W--701568); Lossen 221 (Ba, Vi); T. Meyer 13015 (S), 13329 (S), 13436 (S), 13549 (S); Moldenke & Moldenke 19714 (Es, N); O'Donell 4956 (N); O'Donell & Rodriguez Vaquero 409 (Ca--166101); Osten 13108 (Ug); Pontusi s.n. [Ruiz Leal 16131] (Ss); Ragonese 6241 [Herb. Inst. Bot. Minist. Agr. Nac. 68447] (N); Ragonese & Piccinini 6148 [Herb. Inst. Bot. Minist. Agr. Nac. 69275] (N); M. Ruiz 421 (N); Ruiz Huidobro 255 (Ca, N), 451 (W--1931402), s.n. [Toledo, 17-IV-1944] (N), s.n. [Barrio Mirador, 19-IV-1944] (W--2049637); Ruiz Leal 12218 (Z); Scala 201 (W--1691708), 2001 (N); Villafañe 181 (N), 266 (N), 300 (N), 489 (N), 611 (N), 681 (N), 717 (N), 770 (N); Wall & Sparre s.n. [La Falda, 15/12/46] (Ew). La Rioja: Ruiz Leal 16513 (Rl). Mendoza: Ruiz Leal 7088 (N), 8507 (N), 9047 (N). San Luis: Kurtz 8523 (N); Ruiz Leal 10438 (N). Santa Fé: Balegno 646 (N). Santiago del Estero: Cuezzo 2455 (N, S); M. J. de Luna 31 (N); Luna Risso 69 (N); Pierotti 5 (W--1934017). Tucumán: Balegno 1227 (N, S); O'Donell 4316 (N); Schreiter 7962 [Herb. Inst. Miguel Lillo 32616] (N). CULTIVATED: Argentina: A. G. Schulz 1489 (N--type).

LIPPIA TURBINATA f. *MAGNIFOLIA* Moldenke, *Résumé Suppl.* 10: 4, nom. nud. May 2. 1964; *Phytologia* 10: 172. June 18. 1964.

Synonymy: *Lippia fissicalyx* Troncoso, *Darwiniana* 10: 83--86, fig. 6. 1952.

Bibliography: Troncoso, *Darwiniana* 10: 83--86, fig. 6. 1952; G. Taylor, *Ind. Kew. Suppl.* 12: 82. 1959; Moldenke, *Résumé Suppl.* 7: 6 (1963) and 10: 4. 1964; Moldenke, *Phytologia* 10: 172. 1964; Moldenke, *Biol. Abstr.* 46: 3246. 1965; Moldenke, *Résumé Suppl.* 12: 5. 1965.

Illustrations: Troncoso, *Darwiniana* 10: 85, fig. 6. 1952.

This form differs from the typical form of the species in having its leaves mostly decussate-opposite, the blades regularly larger and wider when mature, to 7 cm. long and 3.3 cm. wide, more broadly elliptic to lanceolate-ovate or oblanceolate to obovate, and the peduncles usually 2 per axil. Collectors describe it as a shrub, to 1.5 m. tall, with corolla varying from white to flesh-color, pinkish-white, lilac, rose, violet, or violet-white.

The type of the form was collected by Santiago Venturi (no. 8120) at an altitude of 1300 meters, Campo Quijaro, Rosario de Ler-

ma, Salta, Argentina, in January, 1929, and is deposited in the United States National Herbarium at Washington. The type of L. fissicalyx was collected by Venturi (no. 8115) at the same locality on January 19, 1929, and is deposited in the herbarium of the Instituto Botanico Darwinion at San Isidro, Argentina.

The plant has been found growing in dry uncultivated or arid hard dry soil, on campos, and along riverbanks, at altitudes of 270 to 1450 meters, flowering from November to May, and fruiting in December and from March to May. The only common name recorded for it is "poleo". The flowers are described as "violet" on Venturi 655; "rose" on Venturi 4288; "violet-white" on Venturi 2429; "lilac" on Herrero 72 and Venturi 8115; "flesh-color" or "pinkish-white" on Lorentz & Hieronymus 236; and "white" on H. H. Bartlett 19778, T. Meyer 3495, and Venturi 2683, 3799, & 8518.

Troncoso (1952) describes this plant as follows: shrub, 1--2 m. tall, branched; branches subtetragonal, yellowish-brown, subglabrous; branchlets small, tetragonal, striate, pubescent; middle internodes 3--4 cm. long, on floriferous branches to 5.5 cm. long; leaves decussate-opposite, rarely ternate, oval or sometimes obovate, 1--1.5 cm. long (including the petiole), 0.5--1.7 cm. wide, usually acute at the apex, cuneate at the base, somewhat bicolorized, regularly dentate on the upper 2/3, entire at the base, with short appressed hairs above more or less regularly distributed on the lamina (the hairs callose at the base, especially those toward the leaf-margins), incanous-pubescent and finely reticulate beneath with the hairs larger along the venation, densely glandular punctate among the pubescence; venation deeply impressed above, especially toward the margins and in the teeth, prominent beneath; peduncles 1 or more usually 2 per axil, 3--6 mm. long, pubescent; heads hemispheric, 5--6 mm. wide; bractlets in many series, the lower ones larger, firm, oval-lanceolate, 3--4.5 mm. long, 1--1.8 mm. wide, 3-veined, pubescent, the upper ones oval, concave, 1.8--2 mm. long, 1.7--2 mm. wide, short-apiculate, pubescent, ciliate-margined, glandular-punctate; calyx in bud 2-lobed, the anterior side split to the base ["y hendido de un lado casi hasta la base, hendidura del lado externo, unido sólo en la cara superior"], during anthesis separating so that in fruit it is diphyllous, the two parts distinct, concave, carinate, and hirsute especially on the keel; corolla small, tubular, 3.5--4 mm. long, bilabiate, the lower lip 3-lobed, the middle lobe developed, the upper reduced and 2-lobed, the tube about 3 mm. long, gently dilated toward the top, pubescent and glandular-punctate on the upper portion; stamens 4, didynamous, inserted in the upper half of the corolla-tube, included; ovary oval, glabrous; stigma apico-lateral; fruit dry, obovate, smooth, 2 mm. long, 1.8 mm. wide, the pericarp spongy on the upper part and sides, the remainder osseous; seeds obovate.

She comments that "Lippia fissicalyx difiere de Lippia turbinata Gris., la especie más afín, por sus hojas opuestas, rara vez ternadas, por sus capítulos generalmente de a 2 por axila; éstos son además semiesféricos, no o muy poco alargados en la fructificación,

nunca turbinados, y por sus hojas más anchas y menos agudas y rígidas. Sin embargo, la existencia de formas de hojas anchas en L. turbinata hace a veces difícil la separación y sugiere la idea de la existencia de híbridos.

"Por inscripciones en ejemplares del Museo de Córdoba, parece evidente que Grisebach consideró esta nueva especie como Lippia geminata var. microphylla, pero también aplicó ese nombre a ejemplares latifolios de Lippia turbinata. Es poco probable, sin embargo, que se trata de dicha variedad por haberse descrito ésta originariamente de Cuba, México y Perú (Grisebach, Fl. Brit. West Ind. Isl., p. 495, 1864), aunque el mismo autor más tarde la cita para Tucumán y Salta (Gris., Symb., p. 278, 1879). Lippia fissicalyx, en todo caso, es vecina de Lippia turbinata y no de Lippia geminata HBK. Por otra parte para la nomenclatura, si se confirma esta sinonimia, la variedad no tiene mayor interés; como ya existe una L. microphylla Cham. (1832), no era posible elevar la variedad de Grisebach al rango de especie." She cites also from Salta Lorentz & Hieronymus 236 (Cd) & s.n. [San José, II.1873] (Cd) and Vattuone 29 (Si), from Jujuy Burkart & Troncoso s.n. [Jujuy, 15. II.1940] (Si--11097), and from Tucumán Lorentz & Hieronymus 1114 (Cd), D. Rodríguez 212 (Si), and Venturi 655 (Si) & 2429 (Si).

Material has been misidentified and distributed in herbaria under the names L. geminata var. microphylla Griseb., L. globiflora var. geminata f. glabriuscula Kuntze, L. poleo Lillo, and L. turbinata Griseb. Venturi 8518 was mistakenly cited by me as L. turbinata in Lilloa 14: 47 and his 655 & 8120 as L. turbinata in my Alph. List Cit.

In all, 42 herbarium specimens, including type material of both names involved, have been examined by me.

Citations: ARGENTINA: Catamarca: Brizuela 237 (N), 810 (N), 1217 (W--2123672); Luna Risso 196 (N). La Rioja: T. Meyer 3495 (N, N, W--1909097). Salta: H. H. Bartlett 19678 (Mi, W--1904616); Herrero 72 (W--2049728); Lorentz & Hieronymus 236 (N, W--281555); Venturi 3799 (W--1591280), 8115 (Gg--166654, W--1443377, W--1591398), 8120 (Gg--166670--isotype, N--isotype, W--1443380--type), s.n. [Agua Caliente, 2.IV.1925; Herb. Mus. Argent. Cienc. Nat. 25/1674] (N). Santiago del Estero: H. H. Bartlett 19778 (Mi, W--1904679). Tucumán: Monetti s.n. [Leal, Las Lecinas, 28.V.1913; Herb. Inst. Miguel Lillo 32086] (N, Ug--11934, W--1802569); D. Rodríguez 212 [Herb. Mus. Argent. Cienc. Nat. 23810; Herb. Inst. Miguel Lillo 32094] (N, N); Venturi 655 [Herb. Inst. Miguel Lillo 32092] (N, W--1591227), 2429 [Herb. Osten 17238] (Gg--151843, Ug, W--1343280, W--1591256), 2683 (W--1591263), 4288 (N, W--1591435), 8518 (E--961964, N, S, W--1591406).

LIPPIA TURNERIFOLIA Cham., Linnaea 7: 217. 1832 [not L. turnerifolia Chod., 1904, nor Hieron., 1947].

Synonymy: Lippia turneraefolia Cham. apud Morong, Britton, & Vail, Ann. N. Y. Acad. Sci. 7: 196. 1893 [not L. turneraefolia Chod., 1904]. Lippia turnerifolia α normalis Kuntze, Rev. Gen. Pl. 3 (2): 253. 1898. Lippia turneriifolia Cham. ex Rosengurtt, Estud. Prad. Nat. Urug. 3: 235, sphalm. 1943. Lantana turneraefolia Cham. ex Moldenke, Alph. List Invalid Names Suppl. 1: 13, in syn. 1947. Lippia turnerifolia Cham. & Schlecht. ex Moldenke, Alph. List Invalid Names Suppl. 1: 15, in syn. 1947. Lippia turnerifolia Cham. ex Moldenke, Résumé Suppl. 12: 11, in syn. 1965. Lippia turnerifolia var. normalis Kuntze ex Moldenke, Résumé Suppl. 12: 11, in syn. 1965.

Bibliography: Cham., Linnaea 7: 217. 1832; Steud., Nom. Bot., ed. 2, 2: 54. 1840; D. Dietr., Syn. Pl. 3: 597. 1843; Walp., Repert. Bot. Syst. 4: 45. 1845; Schau. in A. DC., Prodr. 11: 581—582. 1847; Schau. in Mart., Fl. Bras. 9: 233. 1851; Lorentz, Veg. Nordeste Prov. Entre Ríos, ed. 1, 122 & 150. 1878; Griseb., Abhand. Kaiser. Gesell. Wiss. Götting. 24: [Symb. Fl. Argent.] 277. 1879; Lillo, Fl. Tucuman 94. 1888; Morong, Britton, & Vail, Ann. N. Y. Acad. Sci. 7: 196. 1892; Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 96. 1894; Kuntze, Rev. Gen. Pl. 3 (2): 253 & 315. 1898; Chod., Bull. Herb. Boiss., sér. 2, 2: 820. 1904; Chod., Pl. Hassler. 1 (9): 199. 1902; Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1158 & 1159. 1904; Briq. in Chod. & Hassler, Pl. Hassler. 2 (11): 493 & 494. 1904; Briq., Ann. Conserv. & Jard. Bot. Genève. 7-8: 311. 1904; Glaz., Bull. Soc. Bot. France 58, Mém. 3: 541. 1911; Herter, Florul. Urug. 105. 1930; Moldenke in Fedde, Repert. Nov. Sp. 39: 146. 1936; Herter, Revist. Sudam. Bot. 4: 185—186. 1937; Gallinal, Bergalli, Campal, Aragone, & Rosengurtt, Stud. Nat. Mead. Urug. 81. 1938; Herter, Revist. Sudam. Bot. 6: 97. 1939; Herter, Beih. Bot. Centralbl. 59: 275. 1939; Moldenke, Lilloa 5: 421, 424, & 431—432. 1940; Ragones, Darwiniana 5: 413. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 38, 40, 41, 43, & 96. 1942; Moldenke, Lilloa 8: 427. 1942; Parodi, Darwiniana 6: 175. 1943; Rosengurtt, Estud. Prad. Nat. Urug. 3: 235. 1943; Moldenke, Lilloa 10: 344 & 381 (1944) and 12: 129. 1946; Moldenke, Alph. List Cit. 1: 28 & 39. 1946; Augusto, Fl. Rio Grande do Sul 221, 223, & 234—235, fig. 105b. 1946; Lorentz, Veg. Nordeste Prov. Entre Ríos, ed. 2, 122 & 150. 1947; Moldenke, Phytologia 2: 244, 385, & 386. 1947; Moldenke, Alph. List Invalid Names Suppl. 1: 13 & 15. 1947; Moldenke, Lilloa 14: 40—41, 44, & 48. 1948; Moldenke, Alph. List Cit. 2: 358, 368, 426, 448, 457, 552, 575, 598, & 628 (1948), 3: 695, 781, 798, 911, 921, 922, & 969 (1949), and 4: 1075, 1077, 1166, 1251, & 1256. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 81, 97, 99, 100, 105, & 191. 1949; Moldenke, Phytologia 3: 287. 1950; Stellfeld, Trib. Farmac. 19 (10): 169. 1951; Angely, Fl. Paran. 7: 12. 1957; Moldenke, Résumé 94, 114, 117, 119, 126, 308, 318, & 463. 1959; Moldenke, Résumé Suppl. 1: 7. 1959; Angely, Fl. Paran. 16: 60 (1960) and 17: 46. 1961; Troncoso, Bol. Soc. Argent. Bot. 9: 184. 1961; Moldenke, Résumé Suppl. 10: 6 (1964),

11: 7 (1964), and 12: 11. 1965; Moldenke, *Phytologia* 12: 24, 26, 90, 93, 134--136, 294, 347, & 356. 1965; Rambo, *Pesquis. Bot.* 21: 28 & [59]. 1965.

Illustrations: Augusto, *Fl. Rio Grande do Sul* fig. 105b. 1946.

Dioecious dense bushy shrublets, usually 0.5--0.8 m. tall, sometimes to 1.3 m. tall, with a creeping rhizome; stems herbaceous or suffruticose, erect, simple, rather terete, hirsute with white rigid spreading hairs, finally calvescent and roughened below; leaves decussate-opposite, varying in size and shape with the stature of the entire plant; petioles short; leaf-blades lanceolate or oblong to obovate, 2--5 cm. long, usually about 1 cm. wide or wider, acute at the apex, crenate-serrate along the margins, entire and cuneate at the base and there narrowed into the petiole, impressed-penninerved above, strigose above with bulbous-based hairs and harshly rough, hirsute on the venation beneath but finally merely strigose there; inflorescence axillary and terminal; peduncles filiform, sometimes short and scarcely 1/3 as long as the subtending leaves, sometimes elongate and surpassing the leaves and stems, hirsute; heads rounded or subglobose, dense, to 1.3 cm. wide, involucrate; bractlets ovate, imbricate, acuminate at the apex, equaling the corolla-tube; flowers very small; corolla hypocrateriform, yellow or light-yellow to deep-yellow, sometimes reddish inside.

The type of this rather puzzling species was collected by Friedrich Sellow in dry grassy places on dry hillsides near the town of São Lucia, Rio Grande do Sul, Brazil, on September 17, 1828, and is deposited in the herbarium of the Naturhistorisches Museum at Vienna, where it was photographed by Macbride as his type photograph number 34333. The species has been found growing on campos, rocky or dry grassy campos, dry hills, and rocky grassy slopes, in forests and quebradas, rocky places, and rocky fields on mountainsides, and at the edges of woods, at altitudes of 400 to 2000 meters, flowering from August to March. Balls found it on "steep slopes in heavy clay soil amongst undergrowth and trees, usually on the edge of thickets". Rosengurtt calls it "frequent" in Uruguay, Hunziker refers to it as "rare" in Salta, while Parodi (1943) says "común en praderas húmedas" in Corrientes.

Briquet (1904) says "Cette espèce est extrêmement rapprochée de la précédente [*L. asperrima*], dont elle se distingue cependant par ses pedoncules plus courts, nullement glanduleux-visqueux, mais rendus hirsutes par de longs poils raides étalés ou subascendants très denses."

The flowers are described as "light-yellow" on T. Rojas 377, "deep-yellow" on Balls 5931, "yellow, reddish inside" on T. Rojas 280a, and "yellow" on Bertoni 1943, Herb. Inst. Bot. S. Paulo 23037, 23346, & 36735, F. C. Hoehne s.n., Hoehne & Gehrt s.n., Hunziker 1247, Job 1543, T. Meyer 3452, Osten 4358 & 9181, Rambo 28436, T. Rojas 441, A. G. Schulz 6983, Sleumer & Vervoorst 2778, Stellfeld 1039, and Venturi 7359.

It should be noted here that the L. turnerifolia of Hieronymus, referred to in the synonymy above, is a synonym of Lantana aristata var. angustifolia (Kuntze) Moldenke and that of Chodat is Lippia tristis Briq., L. turnerifolia var. camporum Griseb. is L. contermina Briq., and L. turneraefolia Chod. is L. tristis Briq.

Schauer (1847) places the species in his Section Zapania and Subsection Axilliflorae. Material has been misidentified and distributed in herbaria under the names L. asperrima Cham., L. trachyphylla Briq., L. turnerifolia var. angusta Kuntze, and Lantana sp. On the other hand, the Herb. Inst. Miguel Lillo 32176, 35569, & 37994, Herb. Mus. Argent. Cienc. Nat. 26/1342, Herb. Osten 17237 & 22239, Job 1543, Jørgensen 3775, Kuntze s.n. [Jujuy, Oct. 1892], Malme s.n. [Las Palmaso, 20/3/1903], T. Meyer 3452, Monetti 1138, T. Roig 15427, Rosengurt B.3002, Schreiter s.n. [Mufecas, Dec. 16, 1923] & s.n. [Cerro San Lorenzo, Oct. 18, 1925], and Venturi 531, 2432, 2627, & 3614, distributed as L. turnerifolia, are L. asperrima Cham.; Gallinal, Aragone, Bergalli, Campal, & Rosengurt 1616, Herb. Herter 50765, Herb. Osten 22703, Herter 2033a, T. Meyer 113, and A. G. Schulz 1499 are L. asperrima var. longepedunculata Moldenke; Herb. Inst. Miguel Lillo 32167 and Venturi 1375 are L. contermina Briq.; Herb. Inst. Bot. S. Paulo 36448 and Archer & Gehrt 91 are L. longepedunculata Kuntze; Herb. Herter 82594, Herter 989, Malme 2791, and Morong 575 are L. morongii Kuntze; Kuntze s.n. [Tunari, V.92] is L. trachyphylla Briq.; Legrand 3489 is L. villafloridana Kuntze; and Regnell 1088 and Widgren 1088 are Lantana glaziovii Moldenke. The Jönsson 35a cited by me in Phytologia 12: 90 (1965) as L. asperrima is actually L. turnerifolia.

Schauer (1851) cites a Riedel s.n. from Rio Grande do Sul, while Ragonese (1941) cites his no. 2808 from Santa Fé. Glaziou (1911) cites his no. 21890, but this is actually Casselia glaziovii (Briq. & Moldenke) Moldenke.

In all, 54 herbarium specimens and 5 mounted photographs, including type material of all the names involved, have been examined by me.

Citations: BRAZIL: Paraná: Dombrowski, Saito, & Pereira 947/771/290 (Ac); Dusén 2306 (Ja--34918), s.n. [Jaguariahyva, 24.10.1910] (S), s.n. [Tamandua, 24.11.1910] (S); H. M. Filho 50 [Herb. Mus. Paran. 5319; Herb. Curso Farmac. 714] (S); Hatschbach 1006 (N), 3755 (Z); F. C. Hoehne s.n. [Curitiba, Oct. 18, 1928] (N, Sp--23037), s.n. [Vila Velha, Ponta Grossa, Nov. 3, 1928; Herb. Inst. Bot. S. Paulo 23346, in part] (N); Jönsson 35a (Ca--501674, Ca--533217, Mp, N, S, S, W--1481949); Stellfeld 26 (Mp--1395), 1039 [Herb. Mus. Paran. 2019] (N); Tessmann s.n. [17-10-47; Herb. Mus. Paran. 2508] (N). Rio Grande do Sul: Rambo 28436 (Rb); Sel-

low s.n. [Brasilia, 17.9.1828; Macbride photos 34333] (Br--isotype, It--photo of type, Kr--photo of type, N--isotype, N--photo of type, N--photo of isotype, Vt--isotype, Z--photo of isotype). Santa Catarina: Castellanos 24724 (Ac); Dusén 17928 (S); Smith & Klein 11592 (W--2249378), 11599 (W--2249379); Smith, Reitz, & Caldato 9535 (Ok). São Paulo: Hoehne & Gehrt s.n. [Iperó, Nov. 10, 1936] (Sp--36735). BOLIVIA: Chuquisaca: Troll 60 (B). PARAGUAY: Hassler 9312 (N); Osten 9181 (S, Ug); T. Rojas 280a [Herb. Osten 7909] (N, Ug), 377 [Herb. Osten 7901] (Ug), 441 [Herb. Osten 7903] (Ug). URUGUAY: Arechavaleta s.n. [vicinity of Salto, Nov. 1898; Herb. Osten 3755] (Ug); Herb. Herter 83831 (N); A. Lutz 1653 (Lz); Osten 3104 (Ug), 4358 (Ug); Schröder s.n. [Paysandu, Nov. 1921; Herb. Osten 16350] (Ug). ARGENTINA: Corrientes: Parodi 12386 (N). Jujuy: Balls 5931 (W--1777760). Misiones: Bertoni 1943 (N); Ekman 1998 (S); Rosa Medina 55 (N, S); A. G. Schulz 6983 (Sz). Salta: Hunziker 1247 (W--1804110); Sleumer & Vervoorst 2778 (W--2173213). Tucumán: Venturi 7359 (E--962384).

LIPPIA TURNERIFOLIA var. *ANGUSTA* Kuntze, Rev. Gen. Pl. 3 (2): 253 [as "*β angusta*"]. 1898.

Bibliography: Kuntze, Rev. Gen. Pl. 3 (2): 253. 1898; Briq., Ann. Conserv. & Jard. Bot. Genève. 7-8: 311 & 315. 1904; Briq. in Chod. & Hassler, Bull. Herb. Boiss., sér. 2, 4: 1158. 1904; Briq. in Chod. & Hassler, Pl. Hassler. 2 (11): 494. 1904; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 38, 41, & 96. 1942; Moldenke, Alph. List Cit. 1: 262 (1946) and 2: 370, 553, & 628. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 81, 99, & 191. 1949; Moldenke, Phytologia 3: 287. 1950; Moldenke, Résumé 117 & 463. 1959; Moldenke, Phytologia 12: 294. 1965; Rambo, Pesquis. Bot. 21: 28. 1965.

This variety differs from the typical form of the species in having its leaf-blades 3--5 cm. long, but only 1 cm. or less in width.

The type of the variety was collected by Carl Ernst Otto Kuntze in southern Paraguay in September, 1892, and is deposited in the Britton Herbarium at the New York Botanical Garden. It is not a well-marked variety. Briquet (1904) in speaking of his *L. morongii* says "Le *L. Morongii* ressemble beaucoup dans ses formes réduites au *L. turnerifolia* *β angusta*, quoique le plus souvent son port plus robuste et ses feuilles moins rugueuses le fassent facilement reconnaître. Il s'en distingue essentiellement par l'absence de poils allongés et $\pm$ étalés, exclusivement remplacés par des poils strigieux ascendants et courts: en outre, les bractéoles extérieures des capitules sont largement ovées-acuminées." He also cites a Hassler 10366, from prairies at Itape, collected on September 9, 1874, with yellow flowers. The Hoehne & Gehrt s.n. [Iperó, Nov. 10, 1936; Herb. Inst. Bot. S. Paulo 36735], distributed as this variety, seems to represent the typical form of *L. turnerifolia* instead.

In all, 3 herbarium specimens, including the type, of this variety have been examined by me.

Citations: PARAGUAY: Hassler 308 (Bm, N); Kuntze s.n. [Stud Paraguay, IX.92] (N--type).

LIPPIA TURNERIFOLIA var. SESSILIFOLIA Moldenke, Phytologia 3: 376, nom. nud. 1950; Lloydia 13: 224 [as "turnerifolia var. sessilifolia"]. 1951.

Bibliography: Moldenke, Phytologia 3: 376. 1950; Moldenke, Lloydia 13: 224. 1951; Moldenke, Résumé 94 & 463. 1959; Rambo, Pesquis. Bot. 21: 28. 1965.

This variety differs from the typical form of the species in having its leaves sessile, oblong-elliptic, 2--4 cm. long, and 6--9 mm. wide.

The type of the variety was collected by Padre Balduino Rambo (no. 28180) in shrubby fields at Nonoai on the central Rio Uruguay, Rio Grande do Sul, Brazil, on March 3, 1945, and is deposited in the herbarium of the Colegio Anchieta at Porto Alegre, Brazil. Rambo (1965) cites his collections as Herb. Anchieta 28180 & 28436 from Rio Grande do Sul. He describes the plant as a "Small shrub, 50 cm. high", growing on "Dry, more or less open or shrubby Campos" -- known to him only from the one locality, Nonoai on the Uruguay river. He gives the general distribution of the species, however, as "From Paraná to RGS; from Paraguay to northern Argentina and Uruguay". The taxon is known to me thus far only from the original collection, of which I have examined the type and 4 phototypes.

Citations: BRAZIL: Rio Grande do Sul: Rambo 28180 (E--photo of type, F--photo of type, N--photo of type, Rb--type, Z--photo of type).

LIPPIA UKAMBENSIS Vatke, Linnaea 43: 528--529 [as "L.? ukambensis"]. 1882.

Bibliography: Vatke, Linnaea 43: 528--529. 1882; Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 96. 1894; Gürke in Engl., Pfl. Ost-Afr. C: 338. 1895; J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 281. 1900; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 50 & 96 (1942) and [ed. 2], 118 & 191. 1949; Moldenke, Résumé 145, 146, & 463. 1959; Moldenke, Phytologia 12: 42, 106, 230, 307, 352, & 431 (1965) and 12: 483. 1966.

Shrub or subshrub, 0.6--3 m. tall; stems pithy, branched; sap colorless; branchlets hispid, villous upwards; leaves decussate-opposite, stiff, dry; petioles short; leaf-blades ovate- or oblong-lanceolate, to 5 cm. long, crenate along the margins, attenuate at the base, hispid on both surfaces, rough; heads solitary in the leaf-axils, short-pedunculate, subglobose to finally oblong, about 1.3 cm. long; bractlets oblong, longer than the corolla-tube, acuminate at the apex; flowers with the odor of carnation (Dianthus caryophyllus L.); calyx green; corolla hypocrateriform, white or cream-colored to lemon-yellow with a darker center; anthers yellow.

The type of this species was collected by Johann Maria Hildebrandt (no. 2739) at Kitui, Ukamba, Kenya. The flowers are described as

"white" on A. Peter 42280 & 46706, "lemon-yellow with darker center" on Tanner R.T.849, and "calyx green, corolla cream, anthers yellow" on Drummond & Hemsley 2245.

The species has been found growing in secondary bushland, in grass on hillsides, and on grass steppes, at altitudes of 800 to 1880 meters, flowering in January, February, April, July, and August. Material has been misidentified and distributed in herbaria under the name L. asperifolia A. Rich.

The Greenway 3116 and A. Peter 11244, distributed as L. ukambensis, appear to be L. schliebeni Moldenke. The G. F. S. Elliot 6331 collection, judging from the photograph cited below, greatly resembles L. schliebeni. It is possible that L. schliebeni and L. ukambensis are actually conspecific. A. Peter 1715, 43360a, 43525, & 46706 have very scabrous leaves, while his 46807 has some of the leaves scabrous and some not scabrous!

In all, 12 herbarium specimens and 1 mounted photograph have been examined by me.

Citations: TANGANYIKA: Drummond & Hemsley 2245 (B, S, Z); A. Peter 1682 [O. I. 41] (B), 1715 [O. I. 42] (B), 42280 [V. 283] (B), 43360a [V. 306] (B), 43525 [V. 313] (B), 46087 [V. 139] (B, Z), 46706 [V. 283] (B); Tanner R.T.849 (Ca--182991). KENYA: G. F. S. Elliot 6331 (N--photo).

LIPPIA UMBELLATA Cav., Icon. 2: 75, pl. 194. 1793.

Synonymy: Lantana scabra Sessé & Moc. ex Moldenke, Prelim. Alph. List Invalid Names 29, in syn. 1940. Lippia parviflora Sessé & Moc. ex Moldenke, Prelim. Alph. List Invalid Names 32, in syn. 1940 [not L. parviflora Gardner, 1947].

Bibliography: Cav., Icon. 2: 75, pl. 194. 1793; Spreng. in L., Syst. Veg., ed. 16, 2: 753. 1825; Steud., Nom. Bot., ed. 2, 2: 54. 1840; D. Dietr., Syn. Pl. 3: 599. 1843; Walp., Repert. Bot. Syst. 4: 54--55. 1845; Schau. in A. DC., Prodr. 11: 591. 1847; Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 96. 1894; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 151. 1895; Greenm., Field Mus. Publ. Bot. 2: 341. 1912; Gandoger, Bull. Soc. Bot. France 65: 63. 1918; P. C. Standl., Contrib. U. S. Nat. Herb. 23: 1244, 1246, & 1247. 1924; Anon., Salvador Minist. Instrucc. Publ. Fl. Salvad. 2: pl. 76. 1926; A. B. Seymour, Host Ind. Fungi N. Am. 588. 1929; P. C. Standl., Field Mus. Publ. Bot. 3: 402--403. 1930; Stapf, Ind. Lond. 4: 125. 1930; H. B. Davis, Life & Works Pringle 97. 1936; P. C. Standl., Field Mus. Publ. Bot. 18: 1010. 1938; Moldenke, Alph. List Common Names 11. 1939; Moldenke, Prelim. Alph. List Invalid Names 29 & 32. 1940; Worsdell, Ind. Lond. Suppl. 2: 58. 1941; Calderón & Standl., Fl. Salvad., ed. 2, 238. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 17 & 96. 1942; Moldenke, Alph. List Invalid Names 29 & 32. 1942; Moldenke, Phytologia 2: 71 & 107. 1945; Moldenke, Alph. List Cit. 1: 28, 148, 152, 242, & 251. 1946; Moldenke, Phytologia 2: 330. 1947; B. P. Reko, Soc. Bot. Mex. Bol. 6: 24. 1948; Moldenke, Alph. List Cit. 2: 393, 467, 468, 470, 491, 539--543, 595,

& 632 (1948), 3: 685, 769, 788, 829, 830, 833, 878, 885, 925, & 926 (1949), and 4: 1073, 1075, 1076, 1180, & 1303. 1949; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 10. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 31 & 191. 1949; Moldenke, Spec. Subsp. Cont. Mold. Set 45 p. [2]. 1951; Moldenke, Inform. Mold. Set 46 Spec. 3 (1951), 48 Spec. [3] (1954), and 49 Spec. 2. 1954; Calpouzos, Econom. Bot. 8: 228. 1954; Hocking, Dict. Terms Pharmacog. 128. 1955; Moldenke, Inform. Mold. Set 51 Spec. 3. 1956; Moldenke, Résumé 37, 307, 316, & 463. 1959; Moldenke, Résumé Suppl. 3: 9. 1962; N. L. H. Krauss, Coleop. Bull. 18: 93. 1964; Moldenke, Phytologia 12: 24, 111, 115, 137, 142, 143, 149, 168, 172, 173, 189, 216, 223, 263, 301, 337, 362, & 363 (1965) and 12: 502—504. 1966.

Illustrations: Cav., Icon. 2: pl. 194. 1793; Anon., Salvador Minist. Instrucc. Publ. Fl. Salvad. 2: pl. 76. 1926.

Bush, loose shrub, or small weak round-headed tree, 1--12 m. tall, pleasantly aromatic with the odor of menthol; trunk to 15 cm. in diameter at breast height; stems fruticose, tetragonal; bark gray; wood white; pith central, spongy; branches decussate-opposite, tetragonal, subvillose; leaves decussate-opposite, fragrant, short-petiolate; petioles scarcely 2.5 cm. long, terete, connate; leaf-blades dark-green above, lighter or whitish beneath, narrow-lanceolate to ovate or broadly ovate, 6--20 cm. long, obtuse to attenuate at the apex, acute to rounded at the base, finely or coarsely crenate or serrate along the margins, penninerved, rugose, scabrous or scaberulous above, subtomentose or woolly-tomentose beneath; inflorescences umbellate, in loose rounded cymes to 15 cm. wide, the umbels many, axillary at the apex of the branchlets; primary peduncles almost 4 cm. long, with about 5 rays and a pair of small bracts at the base; flowers congested in heads, the heads very numerous, dense, globular, about 1.3 cm. wide, long-pedunculate, to 2 cm. wide in fruit; bractlets commonly reniform or broadly ovate-cordate, 3 times as long as the flowers, carinate into an acumen at the apex; calyx globose, tomentose, semibifid, the hemispheric segments persistent; corolla hypocrateriform, varying from green- or greenish-yellow, yellow, pale-yellow, deep-yellow, or rich-yellow to dull yellow-cream, fawn, or white, sometimes yellowish and turning red, or deep-yellow with a whitish eye, 2-lipped, the tube conic, as long as the calyx, the throat open, the limb 4-parted, the lobes rounded, subequal, revolute; stamens 4, short, 2 slightly longer than the others; filaments capillary; anthers reddish, ovate; ovary ovate; style simple; stigma globose, subterminal, not emarginate, tomentose; fruit a small capsule, glabrous, covered by the mature calyx-segments, 2-celled, each cell 1-seeded.

The type of this species was collected by Antonio José Cavanilles from cultivated material growing in the botanical garden at Madrid, Spain, flowering and fruiting there at the end of December, grown from seed brought from Mexico two years previous. Cavanilles notes "Linnaeus de Lippia disserens calicem dixit superum, quem Gaertner novissime inferum delineavit tabula 56 ubi Lippiae ameri-

canae fructum descripsit, qui plantae nostrae fructui quadrat, seminibus exceptis quae minime nuda sunt sed capsula biloculari contenta. Linnaeus diversi generis plantas consociavit Lippiae nomine, quas Gaertner reduxit ad Daleam et Lippiam; ex Lippia ovata illud, istud ex Americana. Huic ergo fructicem adiungo Phrymae nomine in laudatum hortum introductum."

It should be noted here that the L. parviflora of Gardner, mentioned in the synonymy above, is a synonym of L. gracilis Schau. The Langlassé 744, cited below from Guerrero, may have been collected in Michoacán -- the locality given on the label is "Moreno".

Schauer (1847) places L. umbellata in his Section Rhodolippia, Subsection A; Briquet (1895) classifies it in Subgenus Zapania, Section Rhodolippia. Walpers (1845) reduces L. callicarpaefolia H.B.K. to this species, but this is entirely unjustified.

Lippia umbellata has been found growing on hills and mountains, foothills and dry sunny hillsides, in rich loam soil, in woods, oak woods and forests, oak & pine or pine-oak-fir forests, pine & fir forests, the sunny sides of cliffs, in hedgerows at the edge of cultivated land, and on pine-oak-madroño openly forested slopes, at altitudes of 400 to 2850 meters, flowering from September to March and in June, and fruiting from October to March. Calderón & Standley (1941) describe it as "common" in El Salvador; McVaugh says of it in Jalisco "abundant here and at lower elevations", "frequent on steep mountainsides in pine-oak forests (zone of broad-leaved trees in barrancas)", and "occasional on steep slopes in cloud forest of firs and broad-leaved trees"; while McVaugh & Koelz found it on precipitous rocky mountain slopes and ravines of gypsum and slate in deciduous woodland with Juliana, Bursera, Cephalocereus, Cryptocarpa, and Cassia.

Standley (1924) and Hocking (1955) report the herbage used in the treatment of colic in Durango. Krauss (1964) notes that the leaves are mined by the beetle Octotoma scabripennis Guérin, but probably he is referring here to L. hypoleia, since his no. 858, identified by him as L. umbellata, is actually L. hypoleia. Seymour (1929) reports that L. umbellata is attacked by the fungi Puccinia elatipes Arth. & Holw. and Prospodium lippiae (Speg.) Arth. [Puccinia lippiae Speg.]. Common names reported for it are "caragra", "droceria", "drosira", "hierba de la mula", "juanislama de monte", "nacare", "oreganillo", "oregano montes", "orégano montés", "rosa de Castilla", "salvia", "salvia poblana", "secaleche", "tabaquillo", "topozana", and "xoltenuuc" -- "oreganillo", however, is also applied to L. cardiostegia Benth., L. graveolens H.B.K., and L. myriocephala Schlecht. & Cham.

The flowers are described as "green-yellow or white" on Hinton 11910, "rich-yellow or fawn color" on Hinton 13550, "greenish-yellow" on Hinton 15706, "dull yellow-cream" on Balls 5489, "pale-yellow" on McVaugh 13935, and "yellow" on Hinton 12791, McVaugh & Koelz 1069, and Rowntree 300.

Standley (1930) reduces L. albicaulis Greenm. and L. yucatana Loes. to synonymy under this species, the latter with a question. He says "I have not seen the type of L. yucatana, collected at Chichen Itzá by Seler (no. 4918), and it may be referable rather to L. myriocephala Schlecht. & Cham." In his 1924 publication he reduces L. albicaulis Greenm., L. chiapasensis Loes., L. pringlei Briq., and L. substrigosa Turcz. to L. umbellata, and says "The numerous specimens at hand show considerable variation, especially in pubescence and size of heads, but there do not appear to be any well-marked characters by which it is possible to distinguish the proposed segregates."

Material has been misidentified and distributed in herbaria under the names L. callicarpaefolia H.B.K., L. callicarpaefolia Kunth, L. durangensis Moldenke, and L. involucrata Sessé & Moc.

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BOOK REVIEW

Alma L. Moldenke

"The Chemistry of Plant Processes", by C. P. Whittingham, 209 pp., illustr. Philosophical Library, Inc., New York 16, New York. \$7.50

The author's words of intention -- "to introduce students who have some basic knowledge in the physical sciences to problems in plant metabolism" -- can be made fact by careful study of this concise book. The first half deals in a quite effective and up-to-date manner with cellular metabolism -- structure, function, enzymes, fermentation, respiration, biological syntheses, photosynthesis, nitrogen metabolism. The second half deals in a more dated manner with plant processes -- osmosis, water relations, translocation, growth.

At the end of chapters there are short, pertinent bibliographies. At the end of the book there is a well selected general bibliography which should be useful to students because it is not indiscriminately and discouragingly lengthy. The work is marred unnecessarily by a few typographic errors, as in the spelling of Nicotiana tabacum on Plate 3 and in names of researchers in the bibliography, and a few errors of content, as in the statement that only far-red absorbing phytochrome causes floral induction. The inclusion of generic names would have been helpful in the index.

This book would serve as a good text for the topic in a general botany course or as a basic one augmented by more detailed and more modern material in a plant physiology course.